DOE/EIS-0226-D (Revised)
November 2008

Revised Draft Environmental Impact Statement for

Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center

The West Valley Site

A Summary and Guide for Stakeholders

NYSERDA

Availability of the
Revised Draft EIS for Decommissioning and/or
Long-Term Stewardship at the West Valley Demonstration Project
and Western New York Nuclear Service Center

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Printed with soy ink on recycled paper

COVER SHEET

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New York State Energy Research and Development Authority (NYSERDA)

Cooperating Agencies: U.S. Nuclear Regulatory Commission (NRC)
U.S. Environmental Protection Agency (EPA)
New York State Department of Environmental Conservation (NYSDEC)

Involved Agency: New York State Department of Health (NYSDOH)

Title: *Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (DOE/EIS-0226-D [Revised])

Location: Western New York Nuclear Service Center, 10282 Rock Springs Road, West Valley, New York 14171-0191 (Erie and Cattaraugus Counties)

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Abstract: The Western New York Nuclear Service Center (WNYNSC) is a 1,352-hectare (3,340-acre) site located 48 kilometers (30 miles) south of Buffalo, New York and owned by NYSERDA. In 1982, DOE assumed control but not ownership of the 66.4-hectare (164-acre) Project Premises portion of the site in order to conduct the West Valley Demonstration Project (WVDP), as required under the 1980 West Valley Demonstration Project Act. In 1990, DOE and NYSERDA entered into a supplemental agreement to prepare a joint EIS to address both the completion of WVDP and closure or long-term management of WNYNSC. A Draft EIS was issued for public comment in 1996: the *Draft Environmental Impact Statement for Completion of the West Valley Demonstration Project and Closure or Long-Term Management of Facilities at*

the Western New York Nuclear Service Center, also referred to as the 1996 *Cleanup and Closure Draft EIS*, DOE/EIS-0226D, January 1996. The 1996 Draft EIS did not identify a Preferred Alternative.

Based on decommissioning criteria for the WVDP issued by NRC since the publication of the 1996 Draft EIS and public comments on the Draft EIS, DOE and NYSERDA prepared this *Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (also referred to as the *Decommissioning and/or Long-Term Stewardship* EIS), revising the 1996 Draft EIS. This EIS has been prepared in accordance with NEPA and SEQR to examine the potential environmental impacts of the range of reasonable alternatives to decommission and/or maintain long-term stewardship at WNYNSC. The alternatives analyzed in this Draft EIS include the Sitewide Removal Alternative, the Sitewide Close-In-Place Alternative, the Phased Decisionmaking Alternative (Preferred Alternative), and the No Action Alternative. The analysis and information contained in this EIS is intended to assist DOE and NYSERDA with the consideration of environmental impacts prior to making decommissioning or long-term management decisions.

Phased Decisionmaking Alternative (Preferred Alternative): Under the Preferred Alternative, decommissioning would be accomplished in two phases: Phase 1 decisions would include removal of all Waste Management Area (WMA) 1 facilities, the source area of the North Plateau Groundwater Plume, and the lagoons in WMA 2. Phase 1 activities would also include additional characterization of site contamination and studies to provide additional technical information in support of the technical approach to be used to complete site decommissioning. Phase 2 would support the completion of decommissioning actions or long-term management. In general, the Phased Decisionmaking Alternative involves near-term decommissioning and removal actions where there is agency consensus and undertakes characterization work and studies that could facilitate future decisionmaking for the remaining facilities or areas.

Public Comments: On March 13, 2003, DOE issued a Notice of Intent (NOI) in the *Federal Register* soliciting public input on development of this Draft EIS. Public comments received during the scoping period (March 13 through April 28, 2003) and comments received on the 1996 Draft EIS have been considered in the preparation of this Draft EIS. Comments on this Draft EIS will be accepted for a period of 6 months following publication of EPA's Notice of Availability (NOA) in the *Federal Register*, and will be considered in the preparation of the Final EIS. Any comments received after the comment period closes will be considered to the extent practicable. The locations and times of public hearings on the Draft EIS will be identified in the *Federal Register* and through other media such as local press notices. In addition to the public hearings, multiple mechanisms for submitting comments on the Draft EIS are available:

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A Message to Stakeholders

The *Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (Draft EIS) is an important step in the path forward for environmental cleanup at the West Valley Site. It represents years of study and efforts by officials from the Federal Government and New York State, as well as site employees, elected officials, community members, and contractors. We want to extend our personal thanks to all personnel and stakeholders who contributed to this achievement.

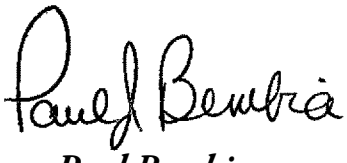
As we move ahead with completion of this EIS, and subsequent site closure activities, it will be equally important that we maintain this collaborative environment and complete the work at West Valley in a cost-effective manner that is protective of the public health. As you know, there are many complexities involved in a long-term project of this type. The Draft EIS analyzes those complexities and presents the results for public review and comment.

A Summary and Guide for Stakeholders provides an overview of the Draft EIS. We hope it proves helpful to you in understanding the issues and challenges so that you can fully participate in the EIS process and provide informed comments on the matters that concern you. It is also intended to help you quickly find the more detailed technical information you may want to review in the complete Draft EIS.

The public comment period for this Draft EIS extends for 6 months from the date of publication in November 2008. During that time, we will hold three public hearings in New York State: one in Buffalo, one at the Ashford Office Complex near the West Valley Site, and one on the Irving Reservation of the Seneca Nation of Indians. At these hearings, written and oral comments on the Draft EIS will be accepted.

We look forward to receiving your comments and to your continued participation as we complete the Final EIS and issue a Record of Decision.

Catherine Bohan
EIS Document Manager
U.S. Department of Energy



Paul Bembia
Program Director
West Valley Site Management
New York State Energy Research
and Development Authority

Interested citizens attending a public hearing

A Summary and Guide for Stakeholders

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Front-end Loader Moving Uncontaminated Soil and Debris

1. Introduction

A Summary and Guide for Stakeholders introduces readers to the *Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center* (Draft EIS). It is intended to make review of the Draft EIS easier for decisionmakers and stakeholders.

For this Environmental Impact Statement (EIS), stakeholders are the people or organizations who have an interest in or may be affected by activities at the West Valley Site. Stakeholders typically include members of the general public; representatives of environmental groups, industry, educational groups, unions, and other organizations; and representatives of Congress, Federal agencies, Native American Tribes, State agencies, and local governments.

Readers interested primarily in the major issues and results presented in the Draft EIS should find their information needs met by this summary document. Key information is presented on the Proposed Action, the proposed alternatives for accomplishing the Proposed Action, the Preferred Alternative, the potential near- and long-term impacts of alternatives, uncertainties in the analyses, potential mitigation measures, and public participation opportunities. Readers who would like more detail on these and other topics are directed to the pertinent sections of the Draft EIS or its appendices. Technical terms have been avoided where possible or defined. A glossary and a list of acronyms and abbreviations have been included in this Summary to further ensure clarity.

Public participation is highly encouraged. Please see Section 7 of this Summary, How Can I Participate?, to learn how you can participate in this process.

Federal and State Responsibility for the Draft EIS

The objective of an EIS is to foster better decisions by providing high-quality environmental information to decisionmakers and the public. The National Environmental Policy Act of 1969 (NEPA) requires Federal agencies to integrate environmental values into their decisionmaking processes by considering the environmental impacts of their proposed actions and reasonable alternatives for implementing those actions. To meet this requirement, Federal agencies prepare analyses consistent with the scope and significance of the potential impacts of the Proposed Action, as required by NEPA. The Draft EIS analyzes the potentially affected environment, which

Brief History of the West Valley Site

- The approximately 81-hectare (200-acre) West Valley Demonstration Project Premises and State-licensed Disposal Area (SDA) are part of the 1,352-hectare (3,340-acre) Western New York Nuclear Service Center, which is owned by the New York State Energy Research and Development Authority (NYSERDA).
- Licensed by the Atomic Energy Commission in 1966, the site was the home of the only operational commercial nuclear fuel reprocessing facility in the United States.
- Approximately 640 metric tons (705 tons) of spent nuclear fuel were reprocessed at the facility between 1966 and 1972, generating 2.5 million liters (660,430 gallons) of high-level radioactive waste.
- The facility was closed for modifications in 1972 and never reopened, leaving tanks of liquid high-level radioactive waste, a storage pool containing spent nuclear fuel, and a contaminated reprocessing building.
- In 1980, Congress passed the West Valley Demonstration Project Act, directing the U.S. Department of Energy (DOE) to conduct a demonstration project for solidification of the high-level radioactive waste at the site.
- High-level radioactive waste vitrification (solidification in a glass matrix) was completed in 2002; 275 canisters of glass waste were produced and are stored at the site pending offsite disposal.
- The West Valley Demonstration Project Act also directed DOE to:
  - Transport the solidified high-level radioactive waste as soon as feasible to an appropriate Federal repository for disposal;
  - Dispose of low-level radioactive waste and transuranic waste that is produced in the process of solidifying high-level radioactive waste; and
  - Decontaminate and decommission the tanks and other facilities in which solidified high-level radioactive waste is stored, the facilities used to solidify the waste, and the materials and hardware used in connection with the project.
- NYSERDA has continued to manage the SDA along with other, non-project areas from the early 1980s to the present.

DOE and NYSERDA are now implementing some specific cleanup activities and jointly preparing this EIS.

What Is the Proposed Action?

The Proposed Action in this Draft EIS is the completion of the West Valley Demonstration Project and the decommissioning and/or long-term management or stewardship of the Western New York Nuclear Service Center.

Purpose and Need

What Does DOE Need To Do?

DOE needs to determine what, if any, material or structures for which it is responsible would remain on site, and what, if any, institutional controls, engineered barriers, or stewardship provisions would be needed.

What Does NYSERDA Need To Do?

NYSERDA needs to determine what, if any, material or structures for which it is responsible would remain on site and what, if any, institutional controls, engineered barriers, or stewardship provisions would be needed.

includes the natural physical environment (air, water, noise, soils, geography, geology, and plant and animal life) and the relationship between humans and the environment (health, safety, jobs, schools, housing, aesthetics, and environmental justice).

New York State follows similar requirements for preparing an EIS under the State Environmental Quality Review Act (SEQR) as part of its decisionmaking process regarding management of the portion of the Western New York Nuclear Service Center (WNYNSC) for which it is responsible. SEQR requires all State and local government agencies to consider environmental impacts equally with social and economic factors in their decisionmaking processes.

The *Draft Decommissioning and/or Long-Term Stewardship EIS* was prepared by DOE and NYSERDA to identify and assess the impacts of the alternatives proposed to meet DOE's responsibilities under the West Valley Demonstration Project (WVDP) Act and NYSERDA's areas of management responsibility. Three cooperating agencies were involved in reviewing the alternatives analyzed in the Draft EIS: the U.S. Nuclear Regulatory Commission (NRC), the U.S. Environmental Protection Agency (EPA), and the New York State Department of Environmental Conservation (NYSDEC). The New York State Department of Health and NYSDEC are involved agencies under SEQR.

As part of the WVDP Act, NRC was charged with developing decommissioning criteria. The NRC Policy Statement prescribes the requirements for decommissioning the WVDP. The decommissioning criteria define the conditions that would allow the WVDP to be used with specified restrictions or without restrictions on future use. If those conditions cannot be met, the NRC Policy Statement also defines the circumstances under which portions of the site could remain under long-term management or stewardship.

What Does the Draft EIS Address?

The Draft EIS includes analyses of potential environmental impacts associated with the range of reasonable alternatives for decommissioning and/or long-term stewardship of the WNYNSC, as well as a No Action Alternative.

The Draft EIS includes:

- Descriptions of the affected environment, including impacts based on human health and safety from normal releases and accidents, waste management, transportation, radiological releases during decommissioning, land use, visual resources, site infrastructure, geology, soils and seismology, water resources, noise, air quality, ecological resources, socioeconomics, and environmental justice

- Results of impact analyses for each of the four alternatives
- Impacts of shipping waste
- Long-term impacts of continued onsite waste storage
- Uncertainties in the analyses due to incomplete or unavailable information
- The explanation and rationale for the DOE and NYSERDA Preferred Alternative

The scope of the Draft EIS is detailed further in Chapter 2 of the Draft EIS.

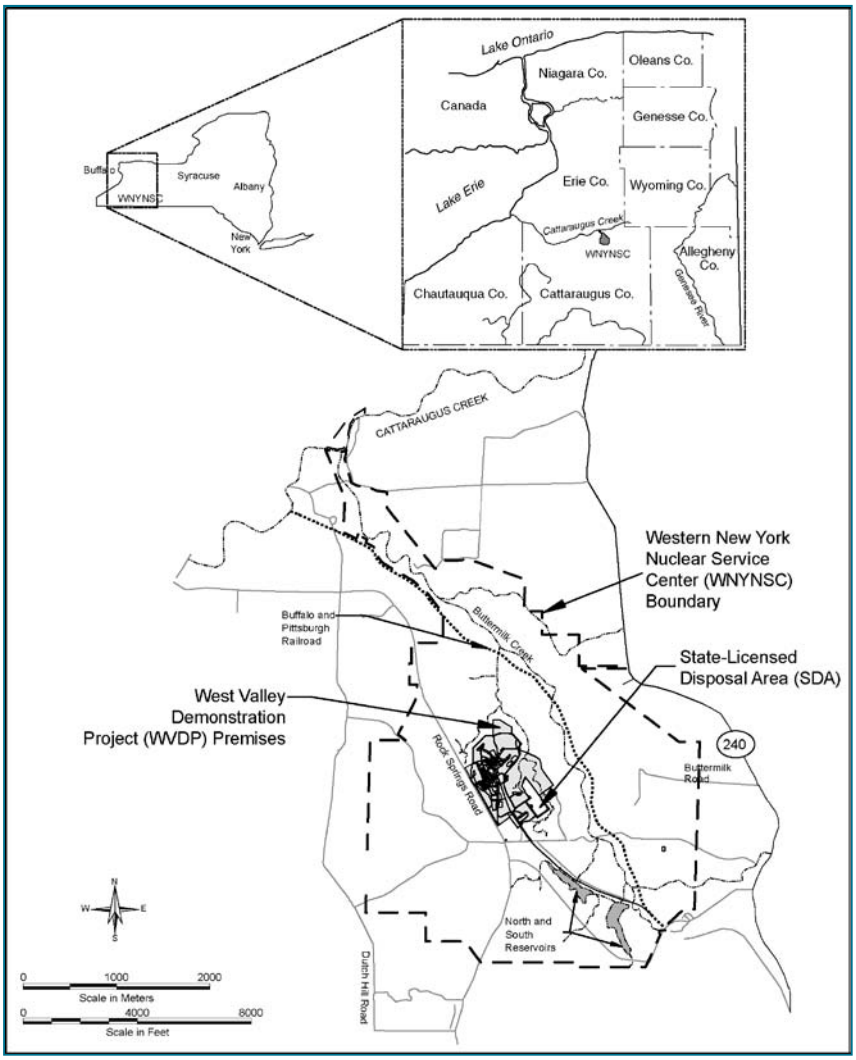
What Makes Up the West Valley Site?

Figure 1 shows the location and boundaries of the WNYNSC (the West Valley Site). *Figures 2* and *3* show the site divided into 12 Waste Management Areas (WMAs); (see Chapter 2, Section 2.3, of the Draft EIS for a more detailed description of the WMAs).

A WMA refers to a geographic unit on the site consisting of facilities and surrounding grounds, including soil, piping, tanks, stored or buried waste, other underlying materials, and associated soil or groundwater contamination within a geographic boundary. DOE manages WMAs 1 through 10, with the exception of WMA 8. NYSERDA manages WMAs 8, 11, and 12.

- WMA 1: Main Plant Process Building and Vitrification Facility Area
- WMA 2: Low-Level Waste Treatment Facility Area
- WMA 3: Waste Tank Farm Area
- WMA 4: Construction and Demolition Debris Landfill (a disposal system in which waste is buried between layers of earth)
- WMA 5: Waste Storage Area
- WMA 6: Central Project Premises
- WMA 7: NRC-licensed Disposal Area (NDA) and Associated Facilities
- WMA 8: State-licensed Disposal Area (SDA) and Associated Facilities

Figure 1. *The Western New York Nuclear Service Center*



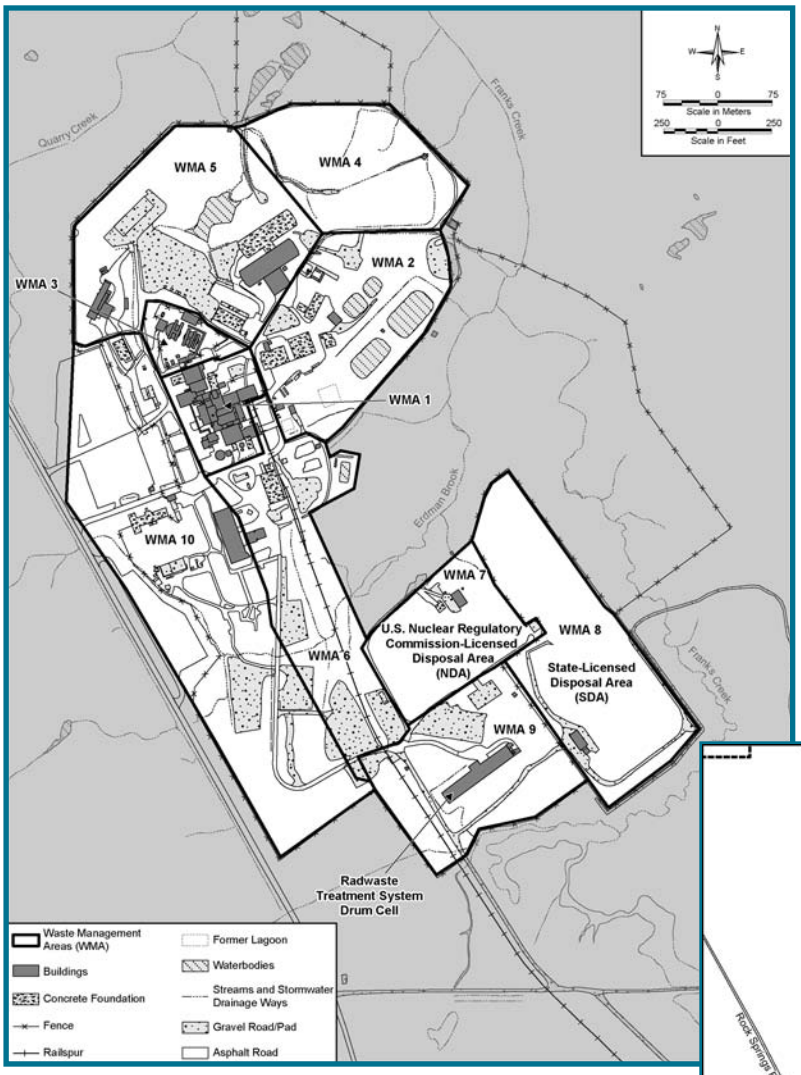


Figure 2. *Location of Waste Management Areas 1 through 10*

- WMA 9: Radwaste Treatment System Drum Cell
- WMA 10: Support and Services Area
- WMA 11: Bulk Storage Warehouse and Hydrofracture Test Well Area
- WMA 12: Balance of Site
- Other geographic units of interest include the Cesium Prong and the North Plateau Groundwater Plume.

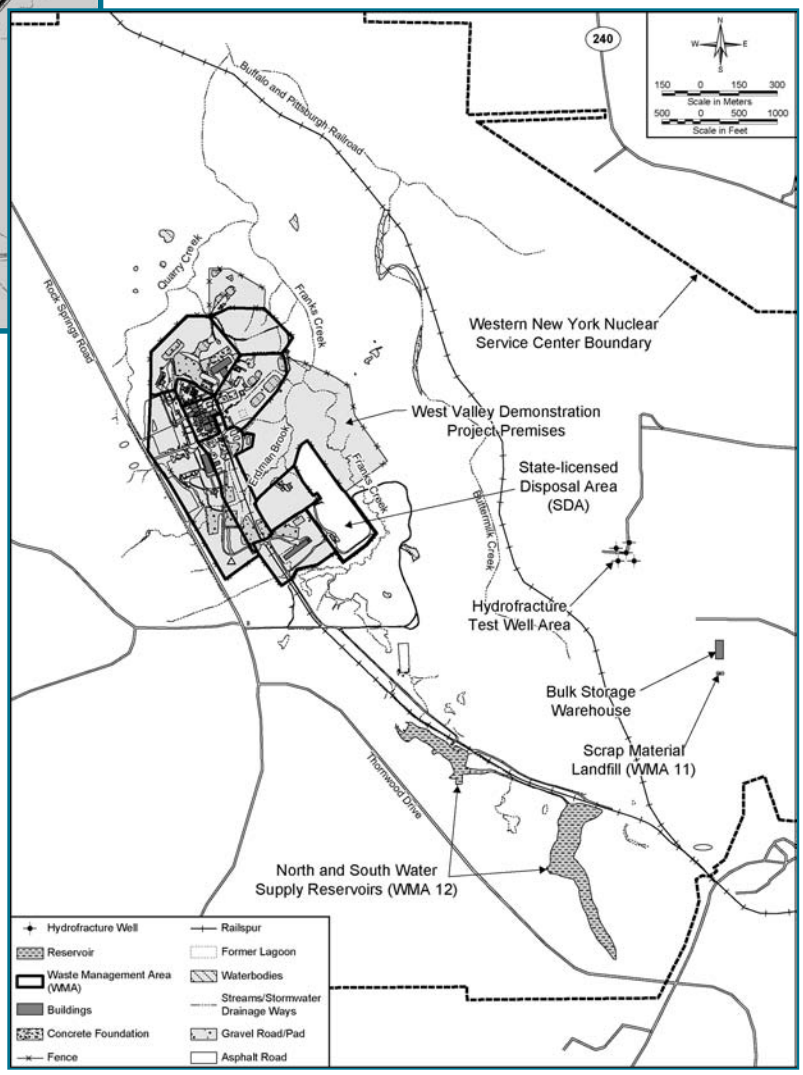


Figure 3. *Waste Management Areas 11 and 12 — Bulk Storage Warehouse and Hydrofracture Test Well Area and Balance of the Western New York Nuclear Service Center*

Why Have DOE and NYSERDA Prepared a Revised West Valley Draft EIS?

The Draft EIS is a revision of the *Draft Environmental Impact Statement for Completion of the West Valley Demonstration Project and Closure or Long-Term Management of Facilities at the Western New York Nuclear Service Center (Cleanup and Closure Draft EIS)* issued by DOE and NYSERDA in March 1996.

The Draft EIS was prepared by DOE and NYSERDA in response to public comments, new information, and new regulatory criteria. It reflects refined assumptions and design features of the alternatives, employs updated methods of analysis, considers input from a citizen task force, and utilizes revised methods for long-term performance assessment (see Chapter 1 of the Draft EIS for a more detailed history).

The steps that led to the Draft EIS include:

- DOE and NYSERDA issued a Notice of Intent in the *Federal Register* in March 2001 announcing:
  - A revised strategy for completing the *Cleanup and Closure Draft EIS*
  - DOE's intent to prepare a separate *West Valley Demonstration Project Waste Management Environmental Impact Statement (WVDP Waste Management EIS)* to analyze decontamination of WVDP facilities and related waste management activities
  - The agencies' intent to initiate a joint EIS for decommissioning and/or long-term stewardship of the WVDP and the WNYNSC (this Draft EIS)
- On November 6, 2001, DOE issued an Advance Notice of Intent to announce its plan to prepare an EIS for decommissioning and/or long-term stewardship of the WVDP and the WNYNSC.[1]
- On March 13, 2003, DOE and NYSERDA published notices in the *Federal Register* and the *New York State Environmental Notice Bulletin*, respectively, announcing their intent to jointly prepare the Draft *Decommissioning and/or Long-Term Stewardship EIS* as a revision of the *1996 Cleanup and Closure Draft EIS*.

[1] *DOE decided that the new WVDP Waste Management EIS would focus exclusively on waste management, and that the Decommissioning and/or Long-Term Stewardship EIS would be the continuation of the 1996 Cleanup and Closure Draft EIS. The WVDP Draft Waste Management EIS was issued for public comment in May 2003, and in final form in January 2004. A Record of Decision regarding the WVDP Waste Management EIS was issued on June 16, 2005.*

What Decisions Will Be Made?

The Draft EIS provides input to DOE and NYSERDA decisionmaking regarding actions to complete the WVDP and to close or manage the WNYNSC, including decommissioning the former spent nuclear fuel facility, the high-level radioactive waste storage tanks, the North Plateau Groundwater Plume, the Cesium Prong, and the NDA.

The Draft EIS also provides analyses to support decisions regarding the decommissioning or long-term management of the SDA.

The information and analyses in the Draft EIS will help decisionmakers address questions such as:

- How and when would the West Valley Site be decommissioned?
- What would be done with the waste; i.e., where would the waste be disposed?
- If the waste were stored onsite pending disposal, how would it be managed?

The results of the analyses presented in the EIS will be considered by the decisionmakers along with mission, policy, cost, public input, and other relevant factors. DOE's decisions regarding the West Valley Site will be announced in a Record of Decision (ROD) to be issued after the Final EIS is published.

A ROD is a concise public document published no sooner than 30 days after the publication of EPA's Notice of Availability of a Final EIS in the *Federal Register* to present and explain an agency's decision(s) concerning the Proposed Action. It identifies the alternatives considered in reaching the decision, the decision made, the environmentally preferable alternative(s), the factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm were adopted, and if not, why.

NYSERDA's decisions regarding the West Valley Site will be announced in the SEQR Findings Statement that also will be issued after publication of the Final EIS. The Findings Statement is a written statement that considers the relevant environmental impacts presented in an EIS; weighs and balances them with social, economic, and other essential considerations; provides a rationale for the agency's decision; and certifies that SEQR requirements have been met.

DOE and NYSERDA Support Phased Decisionmaking as the Preferred Alternative.

Differences of Opinion

NYSERDA and DOE support the Phased Decisionmaking Alternative. The agencies agree that under the first phase of this alternative, important work would be conducted that the agencies believe is critical to keep the project moving toward completion. There is disagreement, however, regarding the level of additional analysis related to long-term performance assessment required to support the Phase 2 decisions.

DOE View. DOE acknowledges the uncertainty inherent in long-term (i.e., 10,000 to 100,000 years) performance assessment modeling. Chapter 4, Section 4.3.5, of the Draft EIS contains a comprehensive list of uncertainties that affect the results of the long-term performance assessment of the site. DOE's analyses account for these uncertainties using state-of-the-art models, generally accepted technical approaches, existing credible scientific methodology, and the best available data in such a way that the predictions of peak radiological and hazardous chemical risks are expected to be conservative (i.e., the results are more likely to overstate rather than understate the actual future consequences). Furthermore, DOE believes the analyses and disclosure of uncertainties in this Draft EIS provide a sufficient quality of information to adequately support agency decisionmaking for all of the reasonable alternatives.

NYSERDA View. As explained in the Foreword to this Draft EIS, NYSERDA believes that the Draft EIS technical analyses of soil erosion, groundwater flow, and contaminant transport, engineered barriers, and uncertainty are not technically defensible for use in long-term decisions regarding West Valley cleanup. NYSERDA does not agree that the analyses are adequate to demonstrate that the predictions of peak radiological and chemical risk are conservative, and NYSERDA believes that a comprehensive analysis of uncertainty is needed.

Demolition of an Industrial Building at the West Valley Site

2. What Is the EIS Starting Point and What Are the Alternatives Analyzed?

The EIS Starting Point

While DOE and NYSERDA have been addressing the difficult challenges involved in planning for closure of the West Valley Site, they have also continued to take action where possible to remove waste or facilities in order to achieve a site status referred to as the Starting Point for this EIS by approximately 2011. Activities needed to achieve the Starting Point are:

- A number of minor, generally uncontaminated facilities will be closed, emptied of equipment, decontaminated as necessary, and demolished down to concrete foundations, floor slabs, or gravel pads.

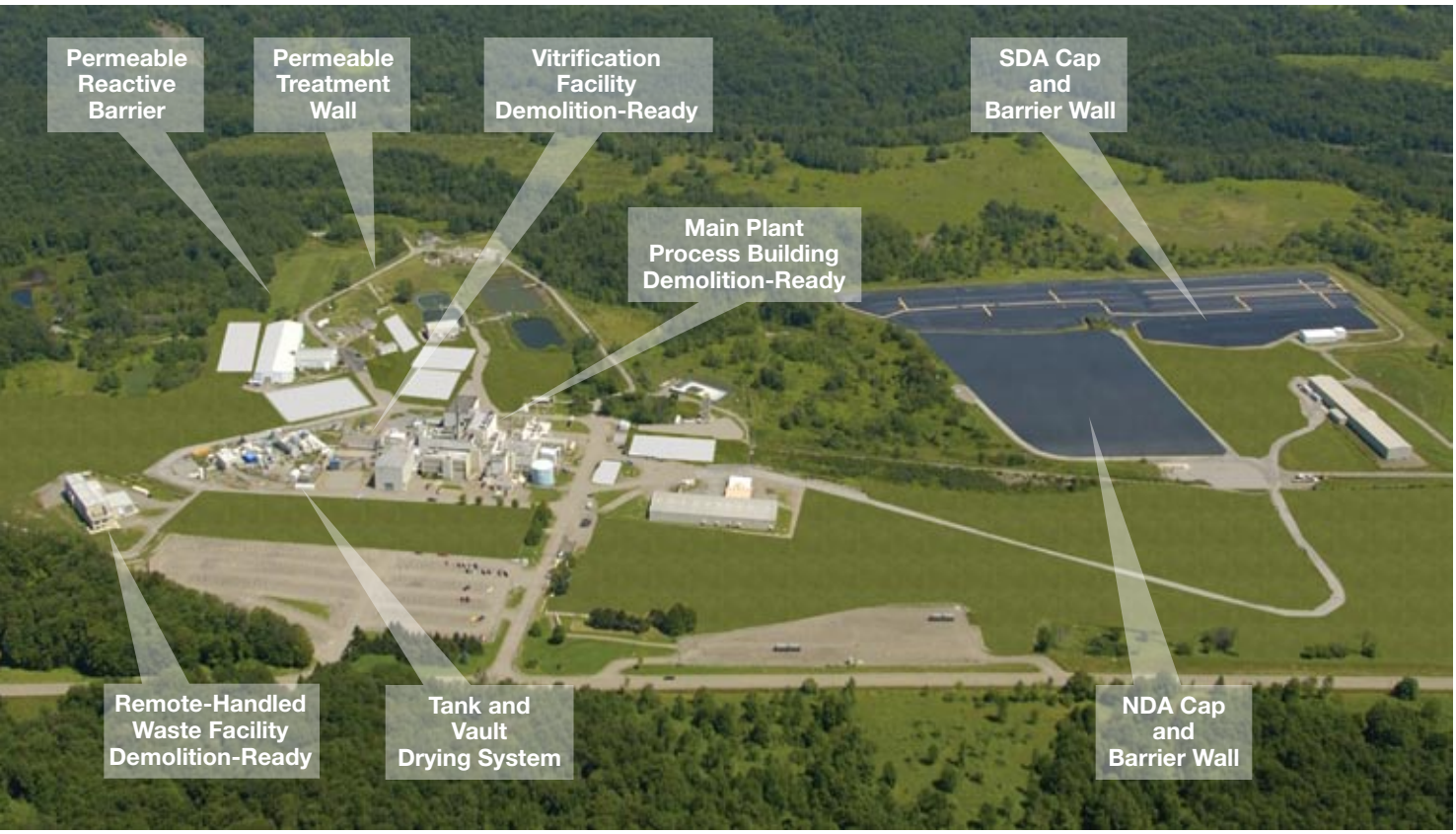
- The Main Plant Process Building, with the exception of the area used for storing vitrified waste canisters and the areas and systems that support high-level radioactive waste canister storage, will be decontaminated to a demolition-ready status. The Vitrification Facility in WMA 1 and the Remote-Handled Waste Facility in WMA 5 will be decontaminated to a demolition-ready status.

- An upgradient slurry/barrier wall will be installed, and a geomembrane cover will be placed over the NDA to help mitigate surface water infiltration.

- A tank and vault drying system will be installed at the WMA 3 Waste Tank Farm to dry the liquid waste contents of Tanks 8D-1 and 8D-2.

- A permeable treatment wall and a permeable reactive barrier will be installed in WMAs 2 and 4, respectively, to mitigate further North Plateau Groundwater Plume migration. The North Plateau Groundwater Plume and background soils will be sampled for potential hazardous constituents that may exist in the plume.

- Waste created by activities to achieve the EIS Starting Point eventually will be shipped off site for disposal, with the possible exception of potential non-defense transuranic waste.



The West Valley Demonstration Project Site as Envisioned in 2011 (the EIS Starting Point)

Alternatives Analyzed in the Draft EIS

Before any decisions can be made as to the Proposed Action, DOE and NYSERDA must complete the EIS process, which includes the analysis of impacts on resource areas; comparison of impacts for each alternative considered, including the Preferred Alternative; and other data necessary to produce the Final EIS.

Four alternatives are analyzed in this Draft EIS (see *Table 1* on page 14):

Sitewide Removal. Under this alternative, all site facilities as outlined in Chapter 2, Table 2-2, of the Draft EIS would be removed; all environmental media would be decontaminated; and all radioactive, hazardous, and mixed waste would be characterized, packaged as necessary, and eventually shipped off site for disposal. This alternative would generate waste for which there is currently no offsite disposal location (e.g., potential non-defense transuranic waste, commercial B/C low-level radioactive waste, Greater-Than-Class C waste). This "orphan" waste would be stored on site until an appropriate offsite facility is available. Completion of these activities would allow unrestricted use of the site (i.e., the site could be made available for any public or private use). The Sitewide Removal Alternative includes temporary onsite storage of vitrified high-level radioactive waste canisters while waiting for a Federal waste repository to open.

Sitewide Close-In-Place. Under this alternative, most facilities would be closed in place. Residual radioactivity in facilities with larger inventories of long-lived radionuclides would be isolated by specially designed closure structures and engineered barriers.

Under the Sitewide Close-In-Place Alternative, major facilities and sources of contamination, such as the Waste Tank Farm and burial grounds, would be managed at their current locations. This would allow large areas of the site to be released for unrestricted use. The license for remaining portions of the WNYNSC could be terminated under restricted conditions, or those portions could remain under long-term NRC license or permit. Facilities that are closed in place, and any buffer areas around them, would require long-term stewardship.

Phased Decisionmaking (the Preferred Alternative). Under this alternative, decommissioning would be completed in two phases. This alternative involves near-term removal actions where there is agency consensus and characterization studies to facilitate decisionmaking for the remaining facilities or areas.

Phase 1 would include removal of foundations, slabs or pads, the Main Plant Process Building, the source of the North Plateau Groundwater Plume, and the lagoons in WMA 2. During Phase 1, all facilities and the lagoons in WMA 2 would be removed, except for the permeable treatment wall. Phase 1 decisions would also include removal of a number of facilities in WMAs 5, 6, 9, and 10. No decommissioning or long-term management activities would be conducted for the Waste Tank Farm and its support facilities, the Construction and Demolition Debris Landfill, the non-source area of the North Plateau Groundwater Plume, or the NDA. The SDA would continue under active management, consistent with its permit and license requirements. Phase 1 activities would also include additional characterization of site contamination and studies to support further evaluations that would determine the technical approach to complete decommissioning.

Phase 1 activities would make use of proven technologies and available waste disposal sites to reduce the potential near-term health and safety risks from residual radioactivity and hazardous contaminants at the site. Additional studies and evaluations would be conducted to clarify and possibly reduce technical uncertainties related to the decision on final decommissioning and long-term management of the site, particularly uncertainties associated with the long-term performance models, the viability and cost of technology for exhuming buried waste, and the availability of waste disposal sites.

During Phase 1, which could take up to 30 years, DOE and NYSERDA also would seek information about improved technologies for in-place containment and for exhuming the tanks and burial areas that may have become available in the intervening years. (See Chapter 2, Section 2.4.3.1, of the Draft EIS for more information regarding evaluations to determine the Phase 2 approach.)

In addition, during Phase 1, DOE and NYSERDA would assess the results of site-specific studies as they become available, along with other emerging information such as applicable technology development. In consultation with NYSERDA and the cooperating and involved agencies on this Draft EIS, DOE would determine whether the new information warrants a new or supplemental EIS. NYSERDA also would assess the results of site-specific studies and other information during Phase 1 to determine the need for additional SEQR documentation.

Phase 2 would complete decommissioning or long-term management decisionmaking according to the approach determined most appropriate during the additional Phase 1 evaluations.

No Action. Under the No Action Alternative, no actions toward decommissioning would be taken. The No Action Alternative would involve the continued management and oversight of all facilities located on the WNYNSC property as of the Starting Point for this EIS. The No Action Alternative does not meet the purpose and need for agency action, but analysis of the No Action Alternative is required under NEPA and SEQR.

Potential Combination Alternative. NYSERDA and DOE recognize that, after consideration of public comments, some combination of alternatives analyzed in the Draft EIS may be identified as the best way to meet agency goals and protect human health and safety and the environment. If a specific combination alternative is identified as preferred between the Draft and Final EISs, DOE would present the combination alternative and its potential impacts in the Final EIS. If a combination alternative is ultimately selected for implementation, the ROD and Findings Statement would explain the reasons DOE and NYSERDA made that decision.

Which Alternatives Were Considered But Eliminated from Detailed Analysis?

Indefinite Storage of Decommissioning or Long-term Management Waste in Existing or New Aboveground Structures. DOE and NYSERDA considered the use of existing structures or the construction of new aboveground facilities for indefinite storage of decommissioning or long-term management waste, but determined this to be unreasonable because construction, maintenance, and replacement of facilities over time would be impractical based on cost, health, environmental, and programmatic factors. Therefore, indefinite waste storage in new or existing facilities onsite was not considered a viable waste management alternative for DOE and NYSERDA's decommissioning activities.

Walk Away. The 1996 *Cleanup and Closure Draft EIS* analyzed an alternative that involved discontinuing all West Valley Site operations and essentially "walking away" from the site, its facilities, and the wastes stored there. The Walk Away Alternative, as defined in the *Cleanup and Closure Draft EIS*, was not a reasonable alternative for consideration in this Draft EIS because it would not meet Federal and State legal requirements and would pose major health and safety issues to the public.

The Preferred Alternative identified and analyzed in an EIS is the alternative that an agency believes would best fulfill its mission and responsibilities after consideration of environmental, economic, technical, and other factors.

Why Is Phased Decisionmaking the DOE and NYSERDA Preferred Alternative?

DOE and NYSERDA have identified the Phased Decisionmaking Alternative as their Preferred Alternative. The rationale for identifying the Phased Decisionmaking Alternative is as follows:

- Phase 1 of the Phased Decisionmaking Alternative would remove major facilities (such as the Main Plant Process Building and lagoons), thereby reducing or eliminating potential human health impacts while introducing minimal potential for generation of new orphan waste (waste that cannot currently be disposed of in an established or a planned permanent disposal facility).

- Phase 1 would remove the source area for the North Plateau Groundwater Plume, thereby reducing the source of radionuclides that are a potentially significant contributor to human health impacts.

- Phase 1 would allow up to 30 years for collection and analysis of data and information on major facilities or areas (such as the Waste Tank Farm, NDA, and SDA), with the goal of reducing technical risks associated with the Sitewide Removal and Sitewide Close-In-Place Alternatives, because one of these alternatives, or a combination, could be selected for Phase 2.

Examples of the technical risks that could be reduced include how to address the Cesium Prong, reaching a determination regarding Waste Incidental to Reprocessing, and further evaluation of long-term impacts. Waste Incidental to Reprocessing refers to wastes resulting from reprocessing spent nuclear fuel that are not highly radioactive and do not need to be disposed of in a geologic repository in order to manage the risk that they pose. The Waste Incidental to Reprocessing would be managed under DOE regulatory authority in accordance with applicable laws and regulations.

The anticipated result of Phase 1 information gathering and analysis is to provide additional information to support decisionmaking for both the removal and in-place closure options for remaining facilities. It is also anticipated that, during Phase 1, progress would be made in identifying and developing disposal facilities for orphan wastes, thereby facilitating removal actions if they are selected as part of Phase 2 decisionmaking. Establishment of improved close-in-place designs or improved analytical methods for long-term performance assessment would facilitate close-in-place actions if they are selected as part of Phase 2 decisionmaking.

Table 1. Summary of Alternatives

	Sitewide Removal	Sitewide Close-In-Place	Phased Decisionmaking Phase 1 Activities (up to 30 years) [a]	No Action
Canisters	Storage in new Interim Storage Facility until they can be shipped off site.	Storage in new Interim Storage Facility until they can be shipped off site.	Storage in new Interim Storage Facility until they can be shipped off site.	No decommissioning actions.
Process Building	Decontamination, demolition without containment and removal from site.	Decontamination, demolition without containment. Rubble used to backfill underground portions of the Main Plant Process Building and Vitrification Facility, and to form the foundation of a cap.	Decontamination, demolition without containment and removal from site.	No decommissioning actions.
High-level Waste Tanks	Removal, including associated contaminated soil and groundwater in Waste Management Area 3.	Backfilled with controlled low-strength material. Strong grout placed between the tank tops and in the tank risers. Underground piping to remain in place and filled with grout. Closed in an integrated manner with the Main Plant Process Building, Vitrification Facility, and North Plateau Groundwater Plume source with a common circumferential hydraulic barrier and beneath a common multi-layer cap.	Remain in place, monitored and maintained with the Tank and Vault Drying system operating as necessary.	No decommissioning actions.
NRC-licensed Disposal Area (NDA)	Removal.	Removal off site of liquid pretreatment system. Trenches, and holes emptied of leachate and grouted. Buried leachate transfer line to remain in place. Existing NDA geomembrane cover replaced with a robust multi-layer cap.	Continued monitoring and maintenance.	No decommissioning actions.
State-licensed Disposal Area (SDA)	Removal.	Leachate removed from disposal trenches and replaced with grout. Waste Storage Facility removed to grade. Existing SDA geomembrane cover replaced with robust multi-layer cap. Hydraulic barrier installed.	Active management for up to 30 years.	No decommissioning actions.
North Plateau Groundwater Plume	Removal.	Plume source area closed in an integrated manner with the Main Plant Process Building, Vitrification Facility and Waste Tank Farm within a common circumferential barrier. Permeable treatment wall installed before decommissioning would remain in place. Non-source area allowed to decay in place.	Removal of source area.	No decommissioning actions.
Cesium Prong	Removal.	Restrictions on use until sufficient decay has taken place.	Managed in place.	No decommissioning actions.

[a] Up to 30 years is the period for all Phase I activities. Decommissioning activities will be completed within 8 years.

Lagoon 2. Storage Basin for Low-level Radioactive Wastewater Prior to Treatment.

Lagoon 3. Storage Basin for Treated Wastewater Awaiting Discharge to Erdman Brook through the State Pollutant Discharge Elimination System (SPDES) - Permitted Discharge.

Slurry Wall Being Constructed in NRC-licensed Disposal Area

3. How Do the Alternatives Compare?

Each of the four alternatives considered in this Draft EIS has the potential to produce near-term impacts to one or more resource areas. Alternatives that would leave residual radioactivity and/or contamination on site also have the potential for local long-term impacts to resource areas.

Comparisons of the proposed alternatives were based on both near- and long-term impacts. Five resource areas where meaningful impact differences could occur were used to compare near-term impacts: land use (land available for reuse), socioeconomics (employment), human health and safety, waste management, and transportation. For comparative analyses of long-term impacts, the population dose to downgradient water users was identified as a meaningful difference among the alternatives.

Near-term refers to the active project phase under each alternative during which implementation (most of the construction, operation, and decommissioning activities) would take place.

Long-term is defined as the timeframe that extends beyond implementation of each alternative.

Near-term Impacts

Near-term impacts for the resource areas identified as having meaningful differences among the alternatives are presented in *Table 2* on page 24 of this Summary. The conclusions regarding the near-term impacts of the EIS alternatives are:

Land Use. The Sitewide Removal Alternative would result in the most land available for release for unrestricted use: the entire 1,352 hectares (3,340 acres) encompassing the WNYNSC. With the exception of land needed to manage orphan waste that may remain on site until a disposition path is available, the entire site would be cleaned up to the point where it could meet the NRC standard for license termination without restriction, which would allow it to be used for other purposes.

The Sitewide Close-In-Place Alternative (after completion of decommissioning activities and decay of the Cesium Prong and nonsource areas of the North Plateau Groundwater Plume) would make 1,100 hectares (2,700 acres) available for unrestricted use. However, it is likely that some land would need to be retained as a buffer zone on the western side of the NDA and for maintenance and erosion control of the South Plateau burial grounds.

Following completion of Phase 1 of the Phased Decisionmaking Alternative, an estimated 690 hectares (1,700 acres) of land would be available for unrestricted use. A determination of the amount of land available for reuse following implementation of Phase 2 would depend on Phase 2 actions. If the selected action is removal of remaining contamination, the remaining 662 hectares (1,600 acres) would become available for reuse, an amount similar to that cited under the Sitewide Removal Alternative. If the decision is in-place closure of the remaining structures, an additional 430 hectares (1,100 acres) would be available for reuse, similar to the Sitewide Close-In-Place Alternative.

For the No Action Alternative, 690 hectares (1,700 acres) would be available for release for unrestricted use. This land would not be needed for continued management and oversight.

Socioeconomics (employment during project implementation). Implementation of the Sitewide Removal Alternative would create the highest level of employment because the duration of work would be longest. Both the Sitewide Close-In-Place Alternative and Phase 1 of the Phased Decisionmaking Alternative would create average annual employment levels similar to those created by the Sitewide Removal Alternative, but for a shorter duration.

No post-decommissioning employment for monitoring and maintenance activities would be required for the Sitewide Removal Alternative, assuming there is no need for temporary orphan waste storage. The other alternatives, including the No Action Alternative, would require a reduced employment level for an indefinite period of time. If the decision for Phase 2 of the Phased Decisionmaking Alternative is removal of remaining contamination, the total employment duration for that alternative would be similar to the Sitewide Removal Alternative, and no post-decommissioning employment would be required for monitoring and maintenance. If the Phase 2 decision is in-place closure of the remaining structures, decommissioning employment duration would be similar to that for the Sitewide Close-In-Place Alternative, and there would be employment following decommissioning during an indefinite long-term stewardship period.

Based on the expected changes in employment levels for each of the alternatives, there would be no discernable impact on the economies of the local and regional areas surrounding the West Valley Site.

Health Risk

Latent cancer fatality (LCF) is a term used to indicate the estimated number of cancer fatalities that may result from exposure to ionizing radiation. Dose conversion factors are used to convert radiation dose to LCFs.

Collective dose refers to the sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation. Collective dose is expressed in units of person-rem.

Human Health and Safety (radiation doses to the public and site workers during implementation of the alternatives). Decommissioning actions would result in radiological releases to the atmosphere and to local waters. These releases would result in radiation exposure and the associated risk of latent cancer fatalities (LCFs) to offsite individuals and populations. Decommissioning actions would also result in occupational exposure to site workers.

Excluding the No Action Alternative, the collective radiation dose to the general population within an 80-kilometer (50-mile) radius of the WNYNSC would range from 27 person-rem (for the Sitewide Close-In-Place Alternative) to 73 person-rem (for the Sitewide Removal Alternative). Less than one additional LCF would be expected in the population as a result of decommissioning actions under any of the alternatives. The peak annual dose to a maximally exposed individual at the site boundary would be highest for Phase 1 of the Phased Decisionmaking Alternative because it has the highest annual radionuclide release rate.

As shown in *Table 2*, the total worker dose for decommissioning actions would range from 130 person-rem for the Sitewide Close-In-Place Alternative to 1,100 person-rem for the Sitewide Removal Alternative. This higher dose would be expected to result in up to

Demolition of an Industrial Building at the West Valley Site

1 additional LCF among the involved worker population. The average worker dose for decommissioning actions would range from 44 to 66 millirem per year, which is well below the site administrative control limit of 500 millirem per year. All workers in radiation areas would be monitored to ensure they stay within the annual limits.

Waste Management. Decommissioning activities and construction and operation of decommissioning facilities under different alternatives would generate different types of waste. Wastes that may require management consist of high-level radioactive waste, nonhazardous waste, hazardous waste, transuranic waste, low-level and mixed low-level radioactive waste, and Greater-Than-Class C waste (see text box on page 26 of this Summary).

The Sitewide Removal Alternative would generate the largest volume of waste from decommissioning activities, but no waste from long-term stewardship. Wastes that may be generated consist of nonhazardous waste, hazardous waste, low-level and mixed low-level radioactive waste (including low specific activity waste), transuranic waste and Greater-Than-Class C waste.

General Disposal Options for Low-Level Radioactive Waste

DOE/Commercial Disposal Option - DOE low-level radioactive waste would be disposed of at DOE disposal facilities (e.g. Nevada Test Site). Commercial low-level radioactive waste would be disposed of at commercial disposal facilities.

Commercial Disposal Option - All low-level radioactive waste would be disposed of at commercial disposal facilities.

For both options, all wastes would be disposed of in accordance with current waste acceptance criteria and appropriate permits/licenses.

Phase 1 of the Phased Decisionmaking Alternative would generate the second largest volume of waste from decommissioning activities. Wastes that may be generated are nonhazardous waste, hazardous waste, low-level and mixed low-level radioactive waste (including low specific activity waste), and transuranic waste.

If the Phase 2 decision is removal of contamination, the amount of decommissioning waste generated is expected to be similar to the amount that would be generated under the Sitewide Removal Alternative. If in-place closure is selected, the total volume of waste generated by the Phased Decisionmaking Alternative would include the Phase 1 waste plus about 30 percent of the waste volume generated by the Sitewide Close-In-Place Alternative.

The Sitewide Close-In-Place Alternative would generate the third largest volume of waste from decommissioning activities, as well as low-level radioactive waste from long-term stewardship activities.

The No Action Alternative would generate no waste from decommissioning activities but the largest volume of waste from annual monitoring and maintenance activities.

Transportation (radiation doses to the public along transportation routes and transportation workers during transportation). Both radiological and nonradiological impacts could result from shipment of radioactive materials from the WNYNSC to offsite disposal facilities. Uncertainty about the locations of facilities for disposal of low-level and mixed low-level radioactive waste was addressed by considering two general disposal options. In the DOE/Commercial Disposal Option, such waste would be transported to a combination of commercial and DOE disposal facilities; and in the Commercial Disposal Option, all such waste would be transported to commercial disposal facilities.

The impacts would be proportional to the distance traveled. DOE and NYSERDA could decide to use a combination of rail and truck shipments during implementation of any of the proposed alternatives. If that were the case, the dose to the general population would be expected to range from the lowest expected dose of about 2.8 person-rem, which is associated with all rail shipments under the Sitewide Close-In-Place Alternative, and the highest expected dose of about 380 person-rem, which is associated with truck shipments to the DOE/Commercial Disposal Option under the Sitewide Removal Alternative.

For the Sitewide Removal Alternative, the highest level of radiological health impacts to transportation workers would occur under the Commercial Disposal Option using all truck shipments; the greatest impacts to the general population would occur under the DOE/Commercial Disposal Option, also using all truck shipments. For the Sitewide Close-In-Place Alternative, the highest level of health impacts to transportation workers and to the general public would both occur under the DOE/Commercial Disposal Option using all-truck shipments. For Phase 1 of the Phased Decisionmaking Alternative, the highest level of health impacts to transportation workers would be from the truck Commercial Disposal Option; the highest level of health impacts to the general public would be from the truck DOE/Commercial Disposal Option. For Phase 2, if the decision is removal of the remaining wastes, total transportation risks for this alternative (Phase 1 and Phase 2) would be equal to those evaluated under the Sitewide Removal Alternative. If the Phase 2 decision is in-place closure, the transportation risks from the additional activities (Phase 2) would be less than those evaluated under the Sitewide Close-In-Place Alternative, due to removal activities already performed under Phase 1 of the Phased Decisionmaking Alternative. However, the total transportation risks for the Phased Decisionmaking Alternative would be greater than those for the Sitewide Close-In-Place Alternative. For the No Action Alternative, the highest level of health impacts to transportation workers and population from all transportation activities would occur under the DOE/Commercial Disposal Option.

The Sitewide Removal Alternative has the highest nonradiological health risk to the public, with the risk ranging from 7.2 to 29 traffic accident fatalities for the various shipping options.[1] The other alternatives would result in less than 1 nonradiological accident fatality, except for the Phased Decisionmaking Alternative, which would have a risk of 3.4 to 4.0 fatalities for the rail shipping options for Phase 1. For Phase 2, if the decision is removal of the remaining wastes, total transportation risks for this alternative (Phase 1 and Phase 2) would be equal to those evaluated under the Sitewide Removal Alternative. If the Phase 2 decision is in-place closure, the transportation risks from the additional activities (Phase 2) would be less than those evaluated under the Sitewide Close-In-Place Alternative, due to removal activities already performed under Phase 1 of the Phased Decisionmaking Alternative. However, the total transportation risks for the Phased Decisionmaking Alternative would be greater than those for the Sitewide Close-In-Place Alternative. Considering that the transportation activities would occur over a period of time from about 10 to 60 years and that the average number of annual traffic fatalities in the United States is about 40,000 per year, the traffic fatality risks under all alternatives would be very small.

[1] *The rail nonradiological accident fatality estimates are based on the conservative assumption of one rail car per train. The use of trains with higher numbers of waste rail cars would result in lower accident fatality estimates.*

Alternatives	Impacts from Decommissioning Actions
Sitewide Removal - All site facilities would be removed - All environmental media would be decontaminated - All radioactive, hazardous, and mixed waste would be shipped off site for disposal	• Entire site would be available for release for unrestricted use. • Requires highest overall level of employment because of long duration. • Incurs highest radiological population dose to the public, but less than 1 LCF. Average worker dose would remain below administrative control limits. • Generates the largest quantity of waste volumes for offsite disposal, about 60 times more than Sitewide Close-In-Place and 7 times more than Phase 1 of Phased Decisionmaking. Greatest volume of potential orphan waste. • Has the highest nonradiological health risk to the public from traffic accidents. • Highest discounted cost per avoided person-rem.
Sitewide Close-In-Place - Major facilities would be closed in place - Residual radioactivity and/or contamination in facilities with larger inventories of long-lived radionuclides would be isolated by specially designed closure structures and engineered barrier - Buffer area and long-term stewardship required	• Portions of the site would be available for release for unrestricted use over a period of time. • Requires high level of employment but over a short duration. • Incurs lowest radiological population dose to the public of the decommissioning alternatives, and less than 1 LCF. Average worker dose would remain below administrative control limits. • Smallest volume of waste including potential orphan waste for offsite disposal. • Would result in less than 1 nonradiological traffic fatality from traffic accidents. • Lowest discounted cost per avoided person-rem.
Phased Decisionmaking (the Preferred Alternative) - Decommissioning would be completed in two phases - Phase 1 activities: removal of Main Plant Process Building, Vitrification Facility and 01-14 Building, source area for the North Plateau Groundwater Plume, lagoons in the Low-Level Waste Treatment Facility Area - SDA would be under active management for up to 30 years - Phase 1 would conduct additional studies and evaluations to clarify and possibly reduce uncertainties related to Phase 2 decisions - Phase 2 would address Waste Tank Farm, Construction Demolition and Debris Landfill, non-source area of the plume, and burial grounds following approach determined through Phase 1 evaluations	• A portion of the site would be available for release for unrestricted use during Phase 1. Balance of the site would be available for unrestricted release if Phase 2 is removal of the remaining facilities/contamination; a smaller portion if Phase 2 is close-in-place for the remaining facilities/contamination. • Lower level of employment for Phase 1 actions. Total employment (worker years) would be similar to Sitewide Removal if Phase 2 is removal of remaining facilities/contamination, similar to Phase 1 plus Sitewide Close-In-Place if Phase 2 is close-in-place for the remaining facilities/contamination. • Incurs radiological population dose to the public between the other decommissioning alternatives, and less than 1 latent cancer fatality. Average worker dose would remain below administrative control limits. • Generates more waste for offsite disposal than Sitewide Close-In-Place, but less than Sitewide Removal for Phase 1 actions. Total waste volumes would be similar to Sitewide Removal if Phase 2 is removal of remaining facilities/contamination, similar to Phase 1 plus 30 percent of Sitewide Close-In-Place volume if Phase 2 is close-in-place for the remaining facilities/contamination. • Would result in less than 1 nonradiological traffic fatality. • Discounted cost per avoided person-rem would be similar to that for Sitewide Removal if Phase 2 is removal of remaining facilities/contamination, closer to that for Sitewide Close-In-Place if Phase 2 is close-in-place for the remaining facilities/contamination.
No Action - No actions taken toward decommissioning - Would require continued management and oversight of all facilities located on the WNYNSC property - Does not meet the purpose and need for agency action	• No decommissioning actions or impacts.

Mitigation Measures for Decommissioning Actions	Monitoring and Maintenance Impacts	Mitigation Measures for Long-term Monitoring and Maintenance	Implementation Schedule
• Runoff and sedimentation controls, spill prevention and control measures, waste water treatment systems, scheduling restrictions to protect water quality. • Dust suppression system, equipment exhaust, building off-gas systems to protect air quality. • Environmental enclosures, building off-gas systems, shield walls, remote operations, protective equipment to protect human health and safety.	• No long-term monitoring or maintenance (stewardship) requirement or impacts. Negligible long-term radiological dose to the offsite public, very small dose to individuals who would reuse the site.	• None necessary.	• 64 years to implement decommissioning actions. • No monitoring or maintenance after removal is complete.
• Runoff and sedimentation controls, spill prevention and control measures, waste water treatment systems, scheduling restrictions to protect water quality. • Dust suppression system, equipment exhaust, building off-gas systems to protect air quality. • Building off-gas systems, shield walls, remote operations, and protective equipment to protect human health and safety.	• Requires a small number of workers in perpetuity. • Small radiological dose to the public and workers (less than No Action). • Small waste volumes (less than No Action). • Results in small to moderate radiological doses in the long-term to the public, assuming institutional controls are in place, moderate dose to an intruder if institutional controls fail.	• Engineered barriers (including erosion control measures), monitoring and maintenance activities to protect the environment and human health and safety.	• 7 years to implement decommissioning actions. • Monitoring and maintenance in perpetuity.
• Runoff and sedimentation controls, spill prevention and control measures, waste water treatment systems, scheduling restrictions to protect water quality. • Dust suppression system, equipment exhaust, building off-gas systems to protect air quality. • Building off-gas systems, shield walls, remote operations, and protective equipment to protect human health and safety.	• Phase 1 requires a small number of workers for up to 30 years; if Phase 2 is close-in-place, fewer workers would be required; no workers would be required if Phase 2 is Sitewide Removal. • Incurs a small radiological dose to the public and workers during Phase 1 monitoring and maintenance. • Long-term human health impacts are comparable to Sitewide Removal if Phase 2 is removal of remaining facilities/contamination. Long-term human health impacts are slightly less than Sitewide Close-In-Place if Phase 2 is close-in-place for the remaining facilities/contamination.	• Engineered barriers (including erosion control measures), monitoring and maintenance activities to protect the environment and human health and safety if Phase 2 involved close-in-place management of portions of the site.	• 8 years for Phase 1 removal actions • Up to 30 years for additional studies and analyses to support Phase 2 decisionmaking. • Additional time to implement Phase 2 decisions. • Potential for monitoring and maintenance in perpetuity, depending on Phase 2 decisions.
	• Non-impacted portions of the site would be available for unrestricted release. • Requires workers in perpetuity. • Incurs annual radiological dose to the public and workers from monitoring and maintenance activities. • Generates waste from monitoring and maintenance activities in perpetuity. • Results in small to moderate radiological doses in the long-term to the public, potentially lethal dose to a resident farmer if institutional controls are lost.	• Existing wastewater treatment systems to protect water quality. • Existing, building off-gas systems to protect air quality. • Existing building off-gas systems, shield walls, and protective equipment to protect human health and safety.	• Monitoring and maintenance in perpetuity.

Table 2. Comparison of Alternatives by Resource Areas for Near-term Impacts [a]

Resource Area	Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative (Phase I only) [b]	No Action Alternative
Duration of Decommissioning Action	64 years	7 years	8 years	None
Duration of Ongoing Monitoring and Maintenance	Necessary only while any orphan waste is being stored	In perpetuity as part of long-term stewardship	In perpetuity as part of long-term stewardship if Phase 2 involves in-place closure	In perpetuity
Land Use [c] – land estimated to be available for unrestricted release upon completion of alternative	Entire 1,352 hectares (except for any land used for optional orphan waste storage)	1,100 hectares	690 hectares	690 hectares
Socioeconomics [d] – average employment	Decommissioning: 260 employees annually Monitoring and Maintenance: 0 employees (assuming no orphan waste management after decommissioning)	Decommissioning: 300 employees annually Monitoring and Maintenance: about 30 employees annually until Interim Storage Facility removed; then about 18, indefinitely	Decommissioning: 230 employees annually Monitoring and Maintenance: About 50 employees annually, up to 30 years	Monitoring and Maintenance: About 75 employees annually, indefinitely
Human Health and Safety (public) [e] – population dose (and risk) to the public – peak annual MEI dose	Decommissioning: 73 person-rem (0.018 LCF) Monitoring and Maintenance: negligible dose, even if orphan and legacy waste are stored onsite 0.26 millirem (8.4×10^{-8} LCF)	Decommissioning: 27 person-rem (0.0093 LCF) Monitoring and Maintenance: 0.00045 person-rem for permeable treatment wall replacement, if necessary 0.14 millirem (4.1×10^{-8} LCF)	Decommissioning: 42 person-rem (0.0056 LCF) Monitoring and Maintenance: 0.0045 person-rem for permeable treatment wall replacement, if necessary 0.84 millirem (1.1×10^{-7} LCF)	Monitoring and Maintenance: 0.077 person-rem per year 0.61 millirem (2.1×10^{-7} LCF)
Human Health and Safety (site workers) [f] – worker population dose (and risk) – average worker dose from decommissioning actions	Decommissioning: 1,100 person-rem (0.70 LCF) Monitoring and Maintenance following decommissioning actions: 0.15 person-rem (8.0×10^{-5} LCF) per year if orphan waste is stored on site 66 millirem (4.0×10^{-5} LCF) per year	Decommissioning: 130 person-rem (0.080 LCF) Monitoring and Maintenance following decommissioning actions: 0.2 person-rem (1.0×10^{-4} LCF) per year 44 millirem (3.0×10^{-5} LCF) per year	Decommissioning: 140 person-rem (0.080 LCF) Monitoring and Maintenance following decommissioning actions: 2.0 person-rem (0.001 LCF) per year 58 millirem (3.0×10^{-5} LCF) per year	Monitoring and Maintenance: 2.6 person-rem per year (0.0020 LCF) 0 millirem (0 LCF) per year
Waste Management [g] – packaged decommissioning waste (cubic meters)	120,000 nonhazardous 18 hazardous 1,500,000 LLW [h] 4,200 GTCC [h] 1,000 TRU [h] 570 MLLW **1,600,000 Total**	15,000 nonhazardous 3 hazardous 10,000 LLW [h] 0 GTCC 39 TRU [h] 410 MLLW **26,000 Total**	35,000 nonhazardous 2 hazardous 170,000 LLW [h] 0 GTCC 710 TRU [h] 41 MLLW **210,000 Total**	None
Waste Management [g] – packaged monitoring and maintenance (M&M) or long-term stewardship (LTS) waste (cubic meters per year)	None [h] (assuming no orphan waste)	0 nonhazardous 0 hazardous 110 LLW 0 GTCC 0 TRU 0 MLLW **110 Total** (LTS)	11 nonhazardous <1 hazardous 180 LLW 0 GTCC 0 TRU 0 MLLW **190 Total** (M&M)	32 nonhazardous 1 hazardous 450 LLW 0 GTCC 0 TRU <1 MLLW **480 Total** (M&M)

Resource Area	Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative (Phase I only) [b]	No Action Alternative
Transportation [i, j] – dose and risk to the public along transportation routes during transportation (person-rem [LCFs])	DOE/Commercial Truck: 380 (2.3×10^{-1}) Rail: 96 (5.7×10^{-2}) Commercial Truck: 360 (2.1×10^{-1}) Rail: 96 (5.7×10^{-2})	DOE/Commercial Truck: 12 (6.9×10^{-3}) Rail: 2.9 (1.8×10^{-3}) Commercial Truck: 10 (6.2×10^{-3}) Rail: 2.8 (1.7×10^{-3})	DOE/Commercial Truck: 71 (4.3×10^{-2}) Rail: 16 (9.8×10^{-3}) Commercial Truck: 59 (3.5×10^{-2}) Rail: 16 (9.7×10^{-3})	DOE/Commercial Truck: 15 (8.8×10^{-3}) Rail: 3.2 (1.9×10^{-3}) Commercial Truck: 12 (7.3×10^{-3}) Rail: 3.2 (1.9×10^{-3})
Transportation [i, j] – dose and risk to transportation workers during transportation (person-rem [LCFs]) [k]	DOE/Commercial Truck: 2,100 (1.3) Rail: 65 (3.9×10^{-2}) Commercial Truck: 2,200 (1.3) Rail: 65 (3.9×10^{-2})	DOE/Commercial Truck: 51 (3.0×10^{-2}) Rail: 2.0 (1.2×10^{-3}) Commercial Truck: 48 (2.9×10^{-2}) Rail: 1.5 (9.0×10^{-4})	DOE/Commercial Truck: 270 (1.6×10^{-1}) Rail: 11 (6.3×10^{-3}) Commercial Truck: 400 (2.4×10^{-1}) Rail: 11 (6.6×10^{-3})	DOE/Commercial Truck: 47 (2.8×10^{-2}) Rail: 2.0 (1.2×10^{-3}) Commercial Truck: 39 (2.3×10^{-2}) Rail: 1.7 (1.0×10^{-3})
Transportation [i, j] – nonradiological accident risk (number of traffic fatalities)	DOE/Commercial Truck: 7.5 Rail: 30 Commercial Truck: 7.2 Rail: 29	DOE/Commercial Truck: 0.090 Rail: 0.37 Commercial Truck: 0.080 Rail: 0.33	DOE/Commercial Truck: 1.0 Rail: 4.0 Commercial Truck: 0.90 Rail: 3.4	DOE/Commercial Truck: 0.060 Rail: 0.20 Commercial Truck: 0.050 Rail: 0.20

GTCC = Greater-Than-Class C waste, LCF = latent cancer fatality, LLW = low-level radioactive waste, MEI = maximally exposed individual, MLLW = mixed low-level radioactive waste, TRU = transuranic waste.

[a] Totals may not add due to rounding. All values, except for the area of the whole WNYNSC under the Sitewide Removal Alternative (which has a known acreage), are rounded to two significant figures.

[b] Magnitude of impacts for the Phased Decisionmaking Alternative depends on the Phase 2 activities implemented.

[c] Source: Chapter 4, Table 4–1, of this Draft EIS, Summary of Land and Visual Resources Impacts.

[d] Source: Chapter 4, Table 4–11, of this Draft EIS, Summary of Socioeconomic Impacts.

[e] Source: Chapter 4, Table 4–12, of this Draft EIS, Summary of Health and Safety Impacts. The peak annual dose to the MEI is the highest of the following locations: receptor at nearest site boundary, on Cattaraugus Creek near the site, or the lower reaches of Cattaraugus Creek.

[f] Source: Chapter 4, Table 4–18, of this Draft EIS, Projected Worker Dose and Risk During and After Decommissioning.

[g] Source: Chapter 4, Table 4–45, of this Draft EIS, Summary of Waste Management Impacts. For all decommissioning alternatives, up to approximately 3.2 cubic meters (110 cubic feet) per year of additional low-level radioactive waste would be generated due to management of orphan waste.

[h] Pre-West Valley Demonstration Project Class B and C low-level radioactive waste, Greater-Than-Class C low-level radioactive waste, and non-defense transuranic waste do not have a clear disposal path and may need to be stored on site until a disposal location is identified. DOE plans to select a location for a disposal facility for Greater-Than-Class C waste and potential non-defense transuranic waste following completion of the *Disposal of Greater-Than-Class C Low-Level Radioactive Waste Environmental Impact Statement* (GTCC EIS) (DOE/EIS-0375).

[i] Source: Chapter 4, Table 4–52, Risks of Transporting Radioactive Waste Under Each Alternative.

[j] For the purpose of comparison to other alternatives, transportation impacts for the No Action Alternative are provided for monitoring and maintenance activities over a 25-year period. Under the DOE/Commercial Disposal Option, wastes are assumed to go to the Nevada Test Site or a western U.S. disposal site. Under the Commercial Disposal Option, only commercial facilities would be used. (There would be no disposition for transuranic and Greater-Than-Class C wastes.)

[k] The dose to transportation workers presented in this table does not reflect administrative controls applied to the workers. In practice, workers who are not trained radiation workers would be limited to a dose of 100 millirem per year, and trained radiation workers would be limited to an Administrative Control Limit of 2 rem per year, which would equal a risk of 0.0012 LCF per year for a trained radiation worker. Enforcement of the administrative limit would most likely be necessary under the Sitewide Removal Alternative.

Note: To convert hectares to acres, multiply by 2.471. To convert cubic meters to cubic feet, multiply by 35.314.

Waste Types

High-level Waste or High-level Radioactive Waste – The high-level radioactive waste which was produced by the reprocessing of spent nuclear fuel at the Western New York Nuclear Service Center. Such term includes both liquid wastes which are produced directly in reprocessing, dry solid material derived from such liquid waste, and such other material as the NRC designates as high-level radioactive waste for the purposes of protecting the public health and safety (West Valley Demonstration Project Act, Public Law 96-368, 94 Stat. 1347). Also see the definition of high-level radioactive waste in the Nuclear Waste Policy Act of 1982, as amended (Public Law 97-425, 96 Stat. 2201), and promulgated in 10 *Code of Federal Regulations* (CFR) 63.2.

Transuranic Waste – DOE radioactive waste not classified as high-level radioactive waste and containing more than 100 nanocuries per gram of alpha-emitting transuranic isotopes with half lives greater than 20 years (40 CFR Part 191).

Hazardous Waste – A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20-24; 6 New York Code of Rules and Regulations (NYCRR) Part 371.1(d)(1), 371.3 (ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the EPA in 40 CFR 261.3-33, or by the State of New York in 6 NYCRR 371.4. Toxicity is determined by the Toxicity Characteristic Leaching Procedure method as given in 40 CFR 261.24; 6 NYCRR 371.3(e).

Low-level Radioactive Waste – Waste that contains radioactivity and is not classified as high-level radioactive waste, transuranic waste, or spent nuclear fuel, or the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material (DOE Manual 435.1-1, 10 CFR 20.1003). In accordance with NRC regulations in 10 CFR 61.55, low-level radioactive waste is further classified into Class A, Class B, and Class C low-level radioactive waste. Low-level radioactive waste may also be categorized as low specific activity waste for the purposes of transportation analyses. Low specific activity wastes have low specific activity, are nonfissile, and meet certain regulatory exceptions and limits. Low specific activity wastes may be transported in large bulk containers.

Mixed Low-level Radioactive Waste – Low-level radioactive waste that also contains hazardous waste regulated under RCRA (42 United States Code [U.S.C.] 6901 et seq.).

Greater-Than-Class C Waste – Low-level radioactive waste that exceeds the concentration limits established for Class C waste in 10 CFR 61.55.

Construction and Demolition Debris – Discarded nonhazardous material including solid, semisolid, or contained gaseous material resulting from construction, demolition, industrial, commercial, mining, and agricultural operations and from community activities. The category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act (42 U.S.C. 2011 et seq.).

Long-term Impacts

Long-term impacts would result from any alternative that would leave radioactive materials on site. For analysis purposes, "long-term" is from the end of the decommissioning action implementation period out to at least 10,000 years, and perhaps longer if the predicted peak annual dose occurs later.

Table 3 provides an overview of the potential long-term impacts for comparison among the alternatives.

Table 3. Comparison of Long-term Impacts

Resource Areas for Comparison of Long-term Impacts	Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative	No Action Alternative
Peak Annual Dose to Offsite Receptors	Essentially negligible.	Less than 1 millirem per year if institutional controls remain in place. On the order of 100 millirem per year if institutional controls fail for many hundreds of years and unmitigated erosion occurs.	If Phase 2 is removal for the remaining Waste Management Areas, long-term impacts would be comparable to Sitewide Close-In-Place Alternative. If Phase 2 is close-in place for the remaining Waste Management Areas, long-term impacts would be slightly less than Sitewide Close-In-Place because the Main Plant Process Building and Low-Level Waste Treatment Facility would have been removed.	Less than 1 millirem per year if institutional controls remain in place. On the order of 100 millirem per year if institutional controls fail for many hundreds of years and unmitigated erosion occurs.
Peak Annual Dose to Onsite Receptors (assumes loss of institutional controls)	Less than 25 millirem per year for very conservative scenarios, much less for more realistic scenarios.	Moderate doses (a few to hundreds of millirem per year) to individuals who have gardens in contaminated soil or wells in contaminated water.		Very large doses (10 to 1,000 rem per year) to individuals who have gardens in contaminated soil or wells in contaminated water.

The **Sitewide Removal Alternative** would have minimal long-term impacts. The contamination would be removed such that an individual in direct contact with residual contamination would receive an annual dose of less than 25 millirem per year, assuming very conservative land reuse scenarios that include houses, gardens, and wells in the highest areas of residual contamination. Other site reuse scenarios would result in substantially lower doses, and the dose to offsite individuals would be many orders of magnitude lower (i.e., negligible).

The **Sitewide Close-In-Place Alternative** would include additional engineered barriers and rely on institutional controls to limit offsite and onsite doses. For this alternative, the estimated dose to offsite individuals, if institutional controls are assumed to remain in place, is less than 1 millirem per year, similar to the dose for the No Action Alternative. The estimated dose to offsite individuals in the event of failure of institutional controls is less than 1 millirem per year if only groundwater release mechanisms are involved (less than the No Action Alternative) and on the order of 100 millirem per year (the same as the No Action Alternative) if there is extended (many hundreds of years) loss of institutional control such that unmitigated erosion occurs. If institutional controls are not in place and there are intruders into the industrialized area, there could be moderate annual doses (10 to 100 millirem) to individuals with gardens containing contaminated soil from large excavation activities or those who use water from contaminated wells. The intruder doses would be less than those for the No Action Alternative; engineered barriers would reduce the likelihood of direct intrusion and slow the migration of contaminants. The highest doses for the Sitewide Close-In-Place Alternative are for a resident farmer with a well in the North Plateau Groundwater Plume, or near the Main Plant Process Building or the Waste Tank Farm.

The long-term human health impacts for the **Phased Decisionmaking Alternative** will depend on the Phase 2 decision. If the Phase 2 decision is removal, the long-term impacts at the site and in the region would be the same as those projected for the Sitewide Removal Alternative. If the Phase 2 decision is close-in-place for the remaining WMAs, the long-term impacts would be slightly less than those for the Sitewide Close-In-Place Alternative because the Main Plant Process Building, the source area of the North Plateau Groundwater Plume, and the Low-Level Waste Treatment Facility lagoons would have been removed.

The **No Action Alternative** would not remove material or add engineered barriers to isolate waste. It would rely on existing barriers and institutional controls to limit offsite and onsite doses. The estimated dose to offsite individuals, if institutional controls are assumed to remain in place, would be less than 1 millirem per year. The estimated dose to offsite individuals in the event of failure of institutional controls is on the order of 10 millirem per year if only groundwater release mechanisms are involved, and on the order of 100 millirem per year if there is extended (many hundreds of years) loss of institutional control such that unmitigated erosion occurs. If institutional controls are lost and there are intruders into the industrialized area, there could be very large annual doses (10 to 1,000 rem) to individuals who have gardens with contaminated soil from large excavation activities or use water from contaminated wells. The high doses could occur near any of the industrial facilities on the project premises and SDA. The No Action Alternative is the baseline for evaluating and comparing the long-term impacts under the decommissioning alternatives.

Cost/Benefit Analysis

Insight into the cost-effectiveness of the alternatives is provided by comparing the ratio of the incremental cost for an alternative (the cost for an alternative less the cost of the No Action Alternative) and the net 1,000-year population dose reduction (the avoided population dose due to removal or increased isolation less the worker and public population dose required to achieve the new end state).

Based on the information in *Table 4*, the Sitewide Close-In-Place Alternative would be more cost effective than the Sitewide Removal Alternative. The incremental cost-effectiveness of the Phased Decisionmaking Alternative would be between approximately $4,500 and $20,000 discounted cost per avoided person-rem.

Table 4. Cost/Benefit Comparative Assessment[a]

Sitewide Removal Alternative	Sitewide Close-In-Place Alternative	Phased Decisionmaking Alternative (Phase 1 only)	No Action Alternative Cost/Benefit Assessment
The Sitewide Removal Alternative would be effective in removing essentially all of the site radionuclide inventory from the accessible environment. The discounted cost per avoided person-rem is estimated to be about $20,000.	The Sitewide Close-In-Place Alternative would be effective in keeping most of the site radionuclide inventory out of the accessible environment. The incremental discounted cost per avoided person-rem (incremental cost-effectiveness) is estimated to be about $2,000.	The cost-effectiveness of this alternative would be driven primarily by the Phase 2 decision. If the Phase 2 decision is timely removal of the remaining Waste Management Areas, the incremental cost-effectiveness ($20,000) would be similar to the Sitewide Removal Alternative. If the Phase 2 decision is timely in-place closure for the remaining Waste Management Areas, the incremental cost-effectiveness ($4,500) would approach that of the Sitewide Close-In-Place Alternative.	The No Action Alternative serves as a baseline for assessing the cost-effectiveness of the decommissioning alternatives.

[a] Cost-benefit analysis is not typically included in a DOE EIS but is included in NRC EISs. The cost-benefit analysis presented in this EIS is intended to increase the utility of the document to the NRC.

Conclusions by Alternative

The following conclusions were derived from the comparative analysis of the proposed alternatives:

- The ***Sitewide Removal Alternative*** would result in the most land available for reuse, and would not require long-term institutional controls (except for the possible temporary management of orphan waste). However, it would incur the greatest collective radiological dose to the public and workers from onsite and transportation activities. The Sitewide Removal Alternative would incur the highest discounted cost per avoided person-rem to total worker and public populations.

- The ***Sitewide Close-In-Place Alternative*** would require the least amount of time to accomplish and would generate the least amount of waste (other than the No Action Alternative) that would need to be disposed of elsewhere. However, it would require long-term institutional controls on site. The reasonably foreseeable long-term peak annual dose to Lake Erie water users would be very small (indistinguishable from the dose associated with background radiation). The Sitewide Close-In-Place Alternative would incur the lowest discounted cost per avoided person-rem to total worker and public populations.

- The ***Phased Decisionmaking Alternative*** (Phase 1) would not result in more land available for release than the No Action Alternative, but would have more positive impacts because its decommissioning activities would remove contaminated facilities and address source terms for groundwater contamination. If Phase 2 calls for removal, total impacts from the Phased Decisionmaking Alternative would be similar to those for the Sitewide Removal Alternative. If Phase 2 is close-in-place, the total waste generation and transportation impacts would be only slightly more than those for Phase 1, and the total worker exposure would almost double that for Phase 1. Long-term impacts would be less than those for the Sitewide Close-In-Place Alternative. If one considers the time-integrated (cumulative) population dose, the first 1,000 years would be reduced to about 50 percent of that for the Sitewide Close-In-Place Alternative; however, the reduction over 10,000 years would be much less (less than 10 percent) because of the dose from the long-lived radionuclides that would remain in the burial grounds. The discounted cost per avoided person-rem to total worker and offsite public populations for the Phased Decisionmaking Alternative would be between that for the Sitewide Removal and the Sitewide Close-In Place Alternatives.

- The ***No Action Alternative*** would not involve decommissioning. Waste and contamination would remain in their current locations, and there would be no change in site operations. This alternative and its impacts serve as the baseline for evaluating decommissioning alternatives.

A Low-level Radioactive Waste Shipment Leaving the West Valley Site

4. What are the Uncertainties In the Analyses?

Implementing any of the proposed alternatives would involve some uncertainty. There are uncertainties regarding the availability of waste disposal sites for some types of waste expected to be generated and the availability of technologies needed to implement alternatives (more detail regarding uncertainties can be found in Chapter 2, Section 2.8, of the Draft EIS). Analytical uncertainties were accommodated by making conservative assumptions in the environmental impact analyses in this Draft EIS. Examples of these uncertainties and how they were addressed are provided below:

Human health. For occupational exposure, information that is incomplete or unavailable includes (1) more detailed information on the radionuclides in the waste, particularly the gamma emitters, (2) the design details for the facilities that would be used for waste handling and processing, and (3) more detailed information on how workers would be utilized in decommissioning actions. This uncertainty was addressed primarily by the use of conservative assumptions regarding exposure rates and by taking no credit in the analyses for decay of the gamma emitters. Active management controls will ensure occupational dose standards are met.

Transportation. Information that is incomplete or unavailable includes (1) more detailed data on the distribution of radionuclides in packaged waste, particularly gamma emitters; (2) the radiation dose from the waste packages; (3) the specific transportation route; and (4) more precise information on how the waste would be shipped (truck, rail, or some combination). This uncertainty was addressed by using conservative assumptions related to the waste package inventory and surface dose rate. Uncertainty about the locations of facilities to dispose of low-level and mixed low-level radioactive waste was addressed by considering two general disposal options. In the *DOE/Commercial Disposal Option*, such waste would be transported to a combination of commercial and DOE disposal facilities; and in the *Commercial Disposal Option*, all such waste would be transported to commercial disposal facilities.

Waste volumes. The waste management analysis has two areas of uncertainty due to the lack of complete information, including (1) the volumes and characteristics of waste that would be generated by each alternative, and (2) the availability of disposal sites for some of the waste, particularly commercial Class B and C low-level radioactive waste, Greater-Than-Class C waste, potential non-defense transuranic waste, and any high-level radioactive waste. The uncertainty related to the volumes and characteristics of the waste is principally related to the minimal amount of site contamination characterization data available for analysis. The Phased Decisionmaking Alternative provides flexibility to address some uncertainty in that additional actions could be analyzed and implemented as part of Phase 2 activities.

Waste disposal options. The lack of availability and regulatory limitations on disposal sites for commercial Class B and C low-level radioactive waste, Greater-Than-Class C waste, potential non-defense transuranic waste, and high-level radioactive waste creates uncertainty about how disposal of these wastes would be accomplished.

Long-term human health. The major elements of incomplete or unavailable information that were used in the calculations include (1) characterization of nature and extent of the contaminants, (2) the performance of engineered barriers and caps, (3) site hydrology and groundwater chemistry, (4) contaminant release rates, (5) long-term erosion-driven release rates of contaminants, (6) contaminant chemistry at the point of release into surface waters and the resulting adsorption and deposition, (7) bioaccumulation in plants and animals, and (8) knowledge of future human activity. To address the uncertainty associated with this incomplete or unavailable information, conservative assumptions were used in the analyses.

Franks Creek – A short distance downstream of its confluence with Erdman Brook and just upstream of the WVDP boundary.

5. Potential Mitigation Measures

Mitigation includes avoiding an impact by not taking a certain action; minimizing an impact by limiting the action's magnitude; rectifying an impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating an impact over time by preservation and maintenance operations; or compensating for an impact by replacing or providing substitute resources or environments.

DOE and NYSERDA developed a series of potential mitigation measures to address the anticipated impacts of the proposed alternatives. *Table 5* presents the potential mitigation measures, resource areas, and proposed alternatives and identifies which resource areas and alternatives would benefit from selected measures. The first part of the table identifies potential mitigation measures that could be applied during design, construction, and demolition activities. The second part identifies potential mitigation measures that could be applied during decommissioning activities when facilities would be operating. The third part of Table 5 identifies mitigation measures (e.g., engineered barriers, access and erosion controls, environmental monitoring) that would reduce potential long-term impacts from implementation of the EIS alternatives.

Soil Characterization Activities

Table 5. Potential Mitigation Measures

Mitigation Measure	Resource Area											EIS Alternative [a]			
	Land Use and Visual Resources	Geology and Soils	Water Resources	Air Quality and Noise	Ecological Resources	Cultural Resources	Socioeconomics	Human Health and Safety	Waste Management	Transportation	Environmental Justice	Sitewide Removal	Sitewide Close-In-Place	Phased Decisionmaking	No Action
Potential Mitigation Measures During Design, Construction, or Demolition [b]															
Visual screens, lower profile buildings	●											●	●	●	
Erosion and sediment controls		●	●		●	●						●	●	●	
Buffer zones			●		●			●				●	●	●	
Wetlands and floodplain protection measures			●		●							●	●	●	
Spill control measures			●		●			●				●	●	●	
Dust suppression measures				●				●				●	●	●	
Use of mufflers, properly sized equipment				●				●				●	●	●	
Scheduling of construction activities			●	●	●		●			●		●	●	●	
Personal protective equipment								●				●	●	●	
Road improvement, traffic controls				●			●	●		●		●	●	●	
Waste minimization									●			●	●	●	
Wastewater treatment systems			●					●				●		●	
Preventing contamination spread		●	●									●	●	●	
Potential Mitigation Measures During Facility Operations															
Road improvement, traffic controls				●			●	●		●		●		●	
Spill control measures			●		●			●				●	●	●	●
Personal protective equipment								●				●	●	●	●
Confinement systems with ventilation controls and filters				●	●			●				● [c]	●	● [d]	
Wastewater treatment systems			●					●				●	●	●	●
Scheduling							●	●		●		● [e]	● [e]	●	●

Mitigation Measure	Resource Area											EIS Alternative[a]			
	Land Use and Visual Resources	Geology and Soils	Water Resources	Air Quality and Noise	Ecological Resources	Cultural Resources	Socioeconomics	Human Health and Safety	Waste Management	Transportation	Environmental Justice	Sitewide Removal	Sitewide Close-In-Place	Phased Decisionmaking	No Action
Potential Long-Term Mitigation Measures															
Engineered barriers			●[f]		●			●					●[g]	●	●
Access controls								●				●[h]	●	●	●
Erosion controls		●[i]	●[i]									●[i]	●[i]	●[i]	●[i]
Environmental monitoring		●	●		●			●				●	●	●	●

[a] A complete description of the alternatives is found in Chapter 2 of this Draft EIS.

[b] Some of these mitigation measures are initially implemented for the construction of facilities that aid decommissioning (e.g., the Container Management Facility) would remain during the operating phase of the facility.

[c] e.g., (1) Waste Tank Farm Waste Processing Facility, (2) Container Management Facility, (3) various enclosures to support exhumation efforts.

[d] Enclosures to support exhumation effort.

[e] e.g., Leachate Treatment Facility.

[f] Circumferential hydrologic barriers utilized as a long-term mitigation measure for protection of water resources (i.e., groundwater quality).

[g] e.g., (1) WMA 1 through WMA 3 hydraulic barrier walls and multi-layer cap, (2) WMA 2 lagoons engineered multi-layer cover, (3) NDA engineered multi-layer cover, (4) SDA engineered multi-layer cover, (5) erosion control structures.

[h] Under the Sitewide Removal Alternative, the Container Management Facility would operate indefinitely until final disposition of decommissioning waste is realized. Access controls would be needed to prevent intrusion into this facility.

[i] Erosion controls as a long-term mitigation measure are more permanent measures when compared to "erosion and sediment controls" for design, construction, or demolition that are more temporary in nature (e.g., mitigation measures usually employed during construction).

High-Level Waste Transfer Trench and Vitrification Facility

6. Where Can I Find Out More?

The Foreword to the Draft EIS presents NYSERDA's view regarding analysis and results presented in the document.

Chapter 1 of this Draft EIS provides a historical overview of activities at WNYNSC, including a brief history of the events leading to development of the document. Topics include the purpose and need for agency action, the scope of the Draft EIS and decisions to be made, the relationship of this Draft EIS to other NEPA documentation, and the process previously used to obtain public input for this Draft EIS.

Chapter 2 describes the actions proposed by DOE and NYSERDA for decommissioning and long-term stewardship of the West Valley Site. It includes descriptions of the range of reasonable alternatives, the No Action Alternative, and a comparison of the alternatives considered and subsequently eliminated from detailed evaluation.

Chapter 3 describes the existing conditions at WNYNSC and the surrounding area and the environmental consequences of the historical activities conducted there on the various resource areas.

Chapter 4 describes the environmental consequences of the alternatives for decommissioning and/or long-term stewardship of the DOE- and NYSERDA-controlled facilities and areas at WNYNSC. Topics include detailed discussions of the potential impacts of the alternatives, cost-benefit considerations, intentional destructive acts, cumulative impacts, resource commitments, unavoidable adverse environmental impacts, the relationship between near-term use of the environment and long-term productivity, and irreversible and irretrievable commitments of resources.

Chapter 5 identifies the Federal, State, and local laws, regulations, agency orders, and requirements that are relevant to this EIS.

Chapter 6 summarizes the potential mitigation measures that DOE and NYSERDA could use to avoid or reduce the potential environmental impacts that may result from implementation of the alternatives.

Chapters 7 through 10 contain references, a glossary, index, list of EIS preparers, and a list of agencies, organizations, and individuals who were sent copies of the Draft EIS.

Appendix A provides a summary of the comments received on the 1996 *Cleanup and Closure Draft EIS.*

Appendix B lists the *Federal Register* Notices and New York State Environmental Notice Bulletins pertaining to this Draft EIS.

Appendix C describes the facilities and waste disposal areas associated with the 12 WMAs that are being considered for decommissioning and/or long-term stewardship. Additional topics include the implementation and new construction activities proposed under each action alternative.

Appendix D provides an overview of the Performance Assessment Approach.

Appendix E discusses geohydrological modeling, including local three-dimensional groundwater modeling, analysis of near-field flow for different EIS alternatives, and independent modeling calibration results.

Appendix F describes the erosion studies conducted as part of the EIS analyses.

Appendix G discusses the long-term performance assessment models used for the EIS analyses.

Appendix H describes the long-term performance assessment results of the EIS analyses.

Appendix I provides a general discussion of radiation and its health effects. It also describes the methodologies and assumptions used to estimate potential impacts on and risks to individuals and the general public from exposure to radioactive and hazardous chemical material releases during normal operations and hypothetical accidents.

Appendix J provides an overview of the approach used to assess the human health risks that could result from transportation of radioactive materials. Topics include the scope of the assessment, packaging and determination of potential transportation routes, analytical methods used for the risk assessment (e.g., computer models), important assessment assumptions, and specific areas of uncertainty and their effects on comparisons of the alternatives.

Appendix K presents the methodology used to estimate nonradiological air quality concentrations for each alternative evaluated in the EIS.

Appendix L discusses decommissioning regulatory compliance issues related to the alternatives.

Appendix M is the Floodplain and Wetland Assessment required by 10 CFR 1022. Topics include the projected impacts of the alternatives on floodplains and wetlands and the mitigation measures that might be taken to ensure regulatory compliance in this area.

Appendix N is the analysis of Intentional Destructive Acts.

Appendix O provides letters documenting the consultations with Federal and State agencies and Tribal Governments.

Appendix P provides a Quantitative Risk Assessment for the SDA, authored by NYSERDA, which evaluates the risk to the public from continued management of the SDA for the next 30 years with its current physical and administrative controls.

Appendix Q provides copies of the concurrence letters on the Draft EIS.

Appendix R provides the Contractor Disclosure Statements.

Finding Answers to Your Questions

For More Information About…	See:
Air Quality	Chapter 3, Section 3.7.2 Chapter 4, Section 4.1.5 Appendix K
Affected Environment	Chapter 3
Alternatives Considered But Eliminated from Detailed Analysis	Summary, Section 1 Chapter 2, Section 2.5
Alternatives Evaluated in this Draft EIS	Summary, Section 2 Chapter 2, Section 2.4
Applicable Laws and Regulations	Chapter 5
Cesium Prong	Chapter 2, Section 2.3.2.14 Appendix C, Section C.2.1.4
Comparison of Impacts	Summary, Section 3 Chapter 2, Section 2.6
Construction of New Facilities and Structures	Chapter 2, Sections 2.4.1.2, 2.4.2.2, and 2.4.3.2 Appendix C, Section C.4
Cost of Alternatives	Chapter 4, Section 4.2
Cultural Resources	Chapter 3, Section 3.9 Chapter 4, Section 4.1.7
Cumulative Impacts of Alternatives	Chapter 4, Section 4.5
Decisions to be Supported by this Draft EIS	Summary, Section 1 Chapter 1, Section 1.5
Ecological Resources	Chapter 3, Section 3.8 Chapter 4, Section 4.1.6
EIS Starting Point	Chapter 2, Section 2.3.1
Environmental Justice	Chapter 3, Section 3.12 Chapter 4, Section 4.1.13

For More Information About…	See:
Erosion	Chapter 3, Section 3.4 Chapter 4, Section 4.1 Appendix F
Floodplains and Wetlands	Chapter 3, Section 3.8.2 Chapter 4, Sections 4.1.4, and 4.5.8 Appendix M
Geology and Soils	Chapter 3, Section 3.3 Chapter 4, Section 4.1.3
Groundwater	Chapter 3, Section 3.6.2 Chapter 4, Section 4.1.4 Appendix E
Human Health Effects	Chapter 3, Section 3.11 Chapter 4, Sections 4.1.9, 4.1.10, and 4.5.13 Appendix I, Sections I.2 and I.3 Appendix J
Land Use	Chapter 3, Section 3.1 Chapter 4, Section 4.1.1
Long-term Impacts of Alternatives	Chapter 2, Section 2.6 Chapter 4, Section 4.1.10
Mitigation Measures	Chapter 6
Near-term Impacts	Chapter 2, Section 2.6 Chapter 4, Section 4.1.9
North Plateau Groundwater Plume	Chapter 2, Section 2.3.2.13 Appendix C, Section C.2.13 Appendix E, Section E.4.1
No Action Alternative	Chapter 2, Section 2.4.4
NRC-licensed Disposal Area	Chapter 2, Section 2.3.2.7 Appendix C, Section C.2.7
Performance Assessment	Appendix D Appendix G Appendix H

For More Information About…	See:
Phased Decisionmaking Alternative	Chapter 2, Section 2.4.3 Appendix C, Section 3.3
Preferred Alternative	Chapter 2, Section 2.7
Proposed Action and Scope of this Draft EIS	Chapter 1, Section 1.4 Chapter 2, Section 2.2
Public Participation and Comment Process	Chapter 1, Section 1.7
Purpose and Need for Agency Action	Chapter 1, Section 1.3
Seismology	Chapter 3, Section 3.5
Site Infrastructure	Chapter 2, Section 2.3 Chapter 3, Section 3.2 Chapter 4, Section 4.1.2 Appendix C, Section C.2
Sitewide Close-In-Place Alternative	Chapter 2, Section 2.4.2 Appendix C, Section C.3.2
Sitewide Removal Alternative	Chapter 2, Section 2.4.1 Appendix C, Section C.3.1
Socioeconomics	Chapter 3, Section 3.10 Chapter 4, Section 4.1.8
State-licensed Disposal Area	Chapter 2, Section 2.3.2.8 Appendix C, Section C.2.8
Surface Water	Chapter 3, Section 3.6.1 Chapter 4, Section 4.1.4 Appendix E, Section E.2.3
Transportation	Chapter 4, Section 4.1.12 Appendix J
Uncertainties	Chapter 2, Section 2.8 Chapter 4, Section 4.3
Visual Resources	Chapter 3, Section 3.1 Chapter 4, Section 4.1.1

For More Information About…	See:
Waste Management	Chapter 3, Section 3.13 Chapter 4, Section 4.1.11
Waste Management Areas	Chapter 2, Section 2.3.2 Appendix C
Western New York Nuclear Service Center – Overview	Summary, Section 1 Chapter 2, Section 2.3
West Valley Demonstration Project	Chapter 1, Section 1.1
Wetlands	Chapter 3, Section 3.8.2 Chapter 4, Section 4.1.6 Appendix M

7. How Can I Participate?

DOE and NYSERDA are committed to open, two-way, formal and informal communication with the public. Throughout the history of EIS development at West Valley, Federal and State agencies have involved the public through formal public meetings and other comment opportunities; website communications; mailings; and informal meetings including working groups, a community forum, and a citizen task force. That commitment to an ongoing dialogue with an informed public continues as the Draft EIS undergoes public review and comment (see *Figure 4*).

DOE and NYSERDA are soliciting comments on the Draft EIS during a 6-month public comment period. During the public comment period, DOE and NYSERDA will jointly hold public hearings for interested members of the public to provide oral or written comments on the Draft EIS. An EIS Website (westvalleyeis.com) has been established to further inform the public about the Draft EIS, how to submit comments, public hearings, and other pertinent information.

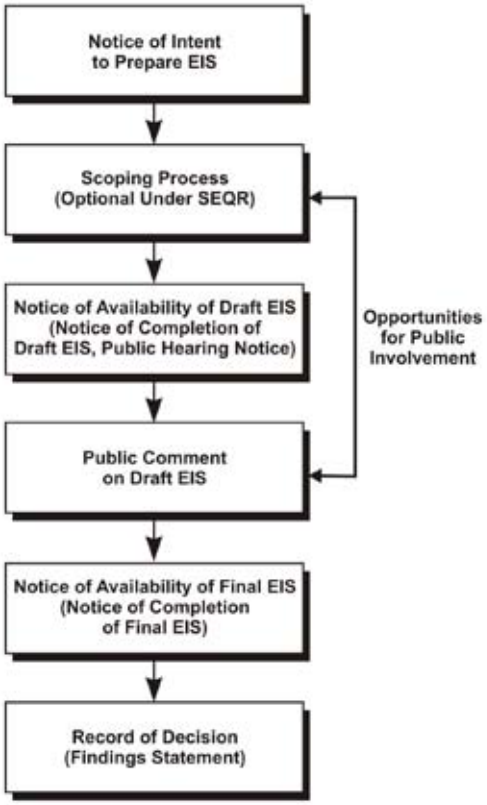


Figure 4. *National Environmental Policy Act Process*

Attend a Hearing

Public hearing dates, times, and locations will be announced in the *Federal Register* and the *State Environmental Notice Bulletin,* in local newspapers, and on the Internet (westvalleyeis.com). Members of the public who have expressed interest and are on the DOE and NYSERDA mailing list for the Draft EIS will be notified by U.S. mail regarding the hearing dates, times, and locations.

Onsite registration and sign-up to provide oral comments will begin 1 hour prior to the start of the public hearing. Subject matter experts will be available in the exhibit area during this time to explain the exhibits and discuss topics related to the Draft EIS. Comment forms and fact sheets will also be available.

The hearings will be facilitated by an independent moderator following a DOE-NYSERDA presentation on the Draft EIS. There will be a short question-and-answer period followed by public comments that will be recorded by a court reporter. Commentors will be given a limited time to speak, depending on the number of participants.

If time allows after all registered speakers have been given an opportunity to comment, people who did not sign up to speak, but who wish to do so, will be called.

Visit a Reading Room

Concord Public Library
18 Chapel Street
Springville, NY 14141
716-592-7742

WVDP Public Reading Room
U.S. Department of Energy
Ashford Office Complex
9030 Route 219
West Valley, NY 14171
716-942-4555

U.S. Department of Energy
FOIA Reading Room
Room 1E-190, Forrestal Bldg.
1000 Independence Ave. SW
Washington, DC 20585
202-586-3142

Submit Your Comments

In addition to the public meetings, multiple mechanisms for submitting comments on the Draft EIS are provided:

- Website: westvalleyeis.com
- U.S. mail: Catherine Bohan, EIS Document Manager
  West Valley Demonstration Project
  U.S. Department of Energy
  P.O. Box 2368
  Germantown, MD 20874
- Toll-free fax: 866-306-9094
- All oral and written comments received at the public meetings and through other mechanisms during the public comment period will be given equal consideration in completing the Final EIS.

Watch For the Final EIS

When the Final EIS is published, its availability will be announced in the *Federal Register* and the New York State *Environmental Notice Bulletin*, in local newspapers, and via U.S. mail. *A Summary and Guide for Stakeholders*, as well as the full Final EIS, will be sent to those who request it in compact disc or print formats. It also will be available on the EIS Website and for review in public reading rooms. Both oral and written comments received during the public comment period will be considered in preparing the Final EIS, and DOE and NYSERDA responses will be presented in a Comment Response Document that will be published as part of the Final EIS.

Based on the Final EIS and other considerations, DOE will announce a decision regarding future actions at the West Valley Site in a ROD to be published in the *Federal Register* no sooner than 30 days after EPA's Notice of Availability of the Final EIS is published. The ROD will describe the alternatives selected for implementation and explain how environmental impacts will be avoided, minimized, or mitigated or, if not, why. NYSERDA will publish a Findings Statement with similar information regarding its decisions in New York State's *Environmental Notice Bulletin*.

8. Helpful Information

Glossary

cask – Heavily shielded container used to store or ship radioactive materials.

cesium – A rare, highly reactive, silver-white element of the alkali metals group.

Cesium Prong – The area of surface soil contaminated by cesium-137 from abnormal releases to the atmosphere caused by reprocessing plant ventilation system failures.

collective dose – The sum of individual doses received in a given period of time by a specified population from exposure to a specified source of radiation. Collective dose is expressed in units of person-rem or person-sievert.

decontamination – Actions taken to reduce or remove chemical or radioactive substances from environmental media (i.e., soil, water, and air), structures (e.g., buildings), equipment, or personnel. Radioactive decontamination may be accomplished by washing, chemical action, mechanical cleaning, or other techniques.

dose (radiological) – The radioactive energy that is absorbed by one gram of material that has been irradiated.

ecological resources – Resources such as broadly defined fish and wildlife populations and habitats, as well as their relationships to each other and the environment/ecosystem.

environmental justice – Executive Order 12898 directs Federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations.

exposure – The amount of radiation or pollutant present in a given environment that represents a potential health threat to living organisms.

floodplain – The portion of a river valley adjacent to the river channel that is built of sediments during the present regimen of the stream and is covered with water when the river overflows its banks at flood stages.

geology – The science that studies the materials, processes, environments, and history of the Earth, including rocks and their formation and structure.

geomembrane – Any impermeable membrane used with soils, rock, earth, or other geotechnical material to block the migration of fluids.

groundwater – Water below the ground surface in a zone of saturation. *Related definition:* Subsurface water is all water that exists in the voids found in soil, rocks, and sediment below the land surface, including soil moisture, capillary fringe water, and groundwater. The part of subsurface water in voids completely saturated with water is called groundwater. Subsurface water above the groundwater table is called vadose water.

hydrofracture – A process to increase a well's yield of water whereby highly pressurized water is pumped down a hole to crack the bedrock in which a well has been drilled.

infrastructure – The basic facilities, services, and utilities needed for the functioning of an industrial facility. Transportation and electrical systems are part of the infrastructure.

latent cancer fatality (LCF) – A statistically based estimate of deaths from cancer resulting from, and occurring some time after, exposure to ionizing radiation or other carcinogens (see *radiation*).

legacy waste – Waste resulting from past activities.

long-term stewardship – Activities necessary to ensure protection of human health and the environment following closure of a site. Long-term stewardship includes engineered and institutional controls designed to contain or to prevent exposure to residual contamination and waste such as monitoring and maintenance activities, record-keeping activities, inspections, groundwater monitoring and treatment, access control, posting signs, and periodic performance reviews.

maximally exposed individual (MEI) – A hypothetical individual whose location and habits are deliberately chosen to result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure routes (e.g., inhalation, ingestion, direct exposure).

media – Materials capable of absorbing or removing contaminants from other materials. Also, the aspects of the environment that may become contaminated (air, water, and soil are environmental media).

millirem – One-thousandth of a rem (see *rem*).

orphan waste – Waste that cannot currently be disposed of in an established or a planned permanent disposal facility.

permeability – The rate at which liquids pass through materials in a specified direction. In hydrology, the term is used to describe the capacity of a rock, sediment, or soil for transmitting groundwater. Permeability depends on the size and shape of the pores between soil particles and how they are interconnected.

person-rem – A unit of collective radiation dose applied to populations or groups of individuals; that is, a unit for expressing the dose when summed across all persons in a specified population or group.

plutonium – A heavy, highly radioactive, metallic element with the atomic number 94 that does not occur in nature and must be produced artificially from uranium.

radiation (ionizing) – Radioactivity resulting from the decay of a radioactive element or produced by radiation-generating equipment.

radioactivity – *As a process:* The spontaneous transformation of unstable atomic nuclei, usually accompanied by the emission of ionizing radiation. *As a property:* The property of unstable nuclei in certain atoms to spontaneously emit ionizing radiation during nuclear transformations.

radwaste – Radioactive waste.

rem – A unit of radiation dose that reflects the ability of different types of radiation to damage human tissues and the susceptibility of different tissues to the damage.

risk – The probability of a detrimental effect to life, health, property, and/or the environment from exposure to a hazard. Risk is often expressed quantitatively as the probability of an adverse event occurring multiplied by the consequences of that event (i.e., the product of these two factors). However, separate presentation of probability and consequence is often more informative.

sediment – Soil, sand, and minerals washed from land into water and deposited on the bottom of a water body.

slurry – A watery mixture of materials that will not dissolve.

source term – The amount of a specific pollutant (e.g., chemical, radionuclide) emitted or discharged to a particular environmental medium (e.g., air, water) from a source or group of sources. It is usually expressed as a rate (i.e., amount per unit time).

upgradient – Upwards against the direction of flow or slope.

uranium – A radioactive, metallic element with the atomic number 92; one of the heaviest naturally occurring elements. Uranium has 14 known isotopes. Uranium-235 is commonly used as a fuel for nuclear fission.

vadose – The zone between the land surface and the water table (saturated zone).

Waste Incidental to Reprocessing – Wastes resulting from reprocessing spent nuclear fuel that are not highly radioactive and do not need to be disposed of in a geologic repository in order to manage the risk that they pose.

wetland – An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in those conditions, including swamps, marshes, bogs, and similar areas.

Acronyms and Abbreviations

CFR – *Code of Federal Regulations*

DOE – U.S. Department of Energy

EIS – Environmental Impact Statement

EPA – U.S. Environmental Protection Agency

LCF – latent cancer fatality

NDA – NRC-licensed Disposal Area

NEPA – National Environmental Policy Act of 1969

NOA – Notice of Availability

NOI – Notice of Intent

NRC – U.S. Nuclear Regulatory Commission

NYCRR – New York Code of Rules and Regulations

NYSDEC – New York State Department of Environmental Conservation

NYSERDA – New York State Energy Research and Development Authority

RCRA – Resource Conservation and Recovery Act

ROD – Record of Decision

SDA – State-licensed Disposal Area

SEQR – State Environmental Quality Review Act

U.S.C. – United States Code

WMA – Waste Management Area

WNYNSC – Western New York Nuclear Service Center

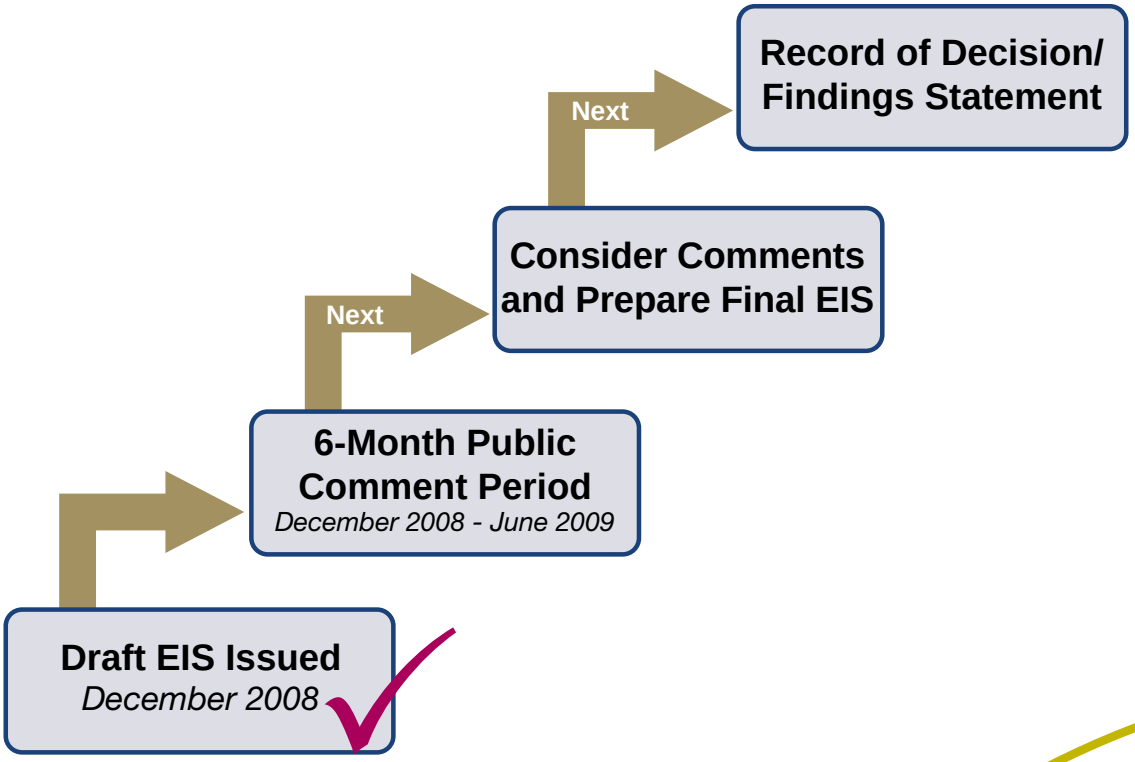
WVDP – West Valley Demonstration Project

Conversions

To convert acres to hectares, multiply by 0.4047.

To convert cubic feet to cubic meters, multiply by 0.02832.

Next Steps:



For more information:

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DOE/EIS-0226-D
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http://www.wv.doe.gov